

# THE IRON AGE

A Review of the Hardware, Iron Machinery and Metal Trades.

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Reading Matter Contents.....	page 50
Alphabetical Index to Advertisers "	137
Classified List of Advertisers.... "	139
Advertising and Subscription Rates "	57



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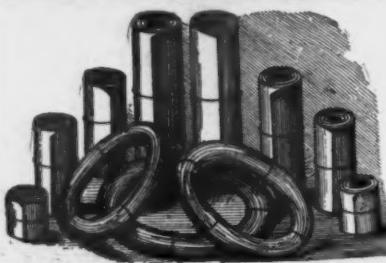
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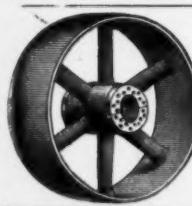
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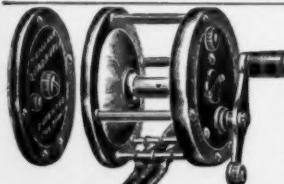
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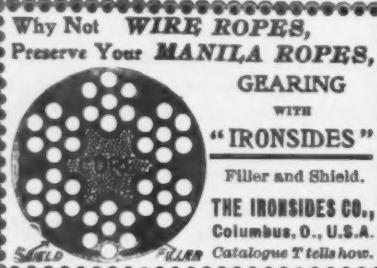
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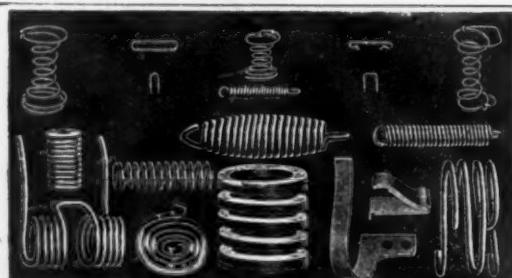
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WILLIAMSPORT, PA.



OF ALL KINDS AND SIZES AND FOR ALL PURPOSES.

## THE STEWART WIRE COMPANY. — Office and Works, EASTON PENNA.

BRIGHT  
ANNEALED  
COPPERED  
TINNED

ALL SIZES

**WIRE**  
— ALL VARIETIES —

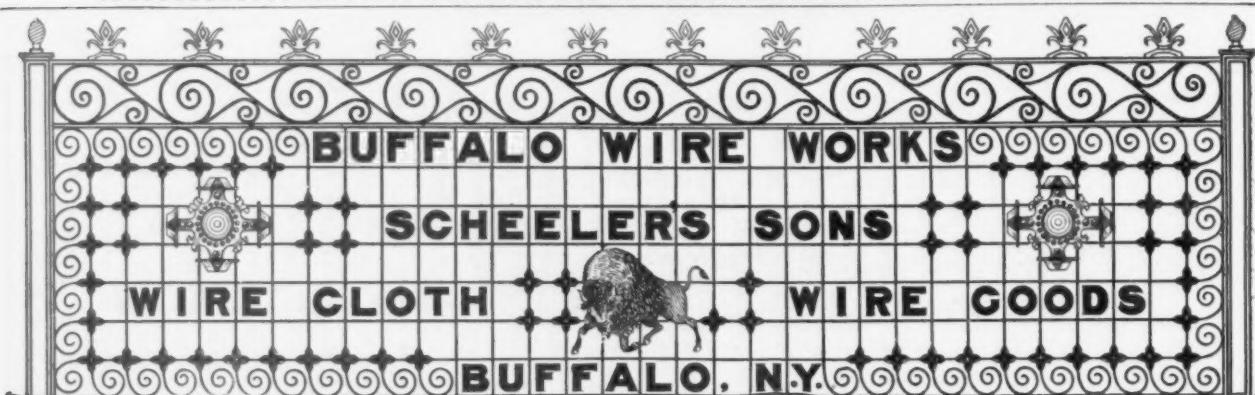
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BRIGHT  
SPRING  
SCREW  
RIVET

Wire Straightened and Cut to Specified Lengths.

Piqua  
Roofings

Are world-famous for their honest merits and the certainty of protection their use assures to the buyer. Made of Iron or Steel, Plain, S.S. Corrugated or V-crimp. Grade highest, but lowest in price, quality considered. Write for book of testimonials.

**The Cincinnati Corrugating Co.,**  
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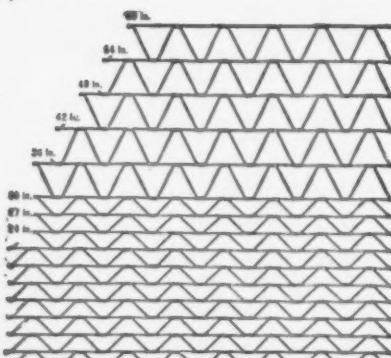


Garry Iron and  
Steel Roofing Co.

Eave  
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Conductor  
Pipe.  
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Ridging.  
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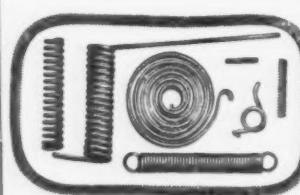
Cor. Coe and Lake Sts.,  
CLEVELAND, OHIO.

**"Hartman" "Stockade"**



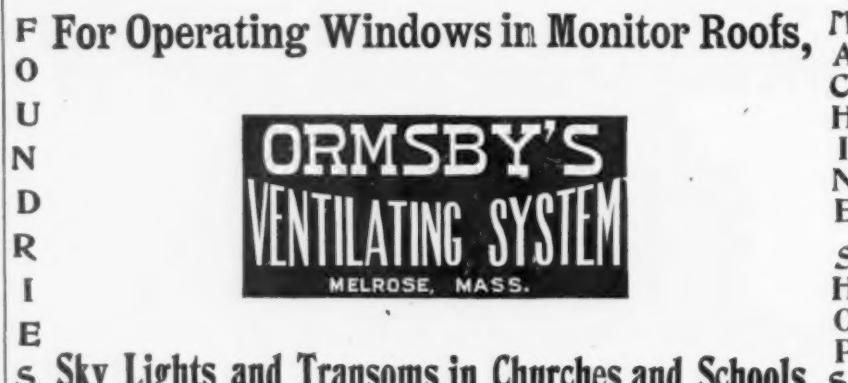
**FIELD and HOG FENCE.**

**HARTMAN MFG. CO.**  
of Ellwood City, Pa.

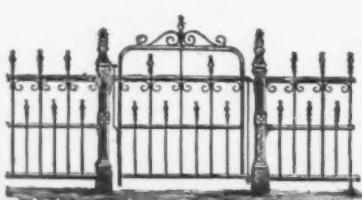


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**SPRINGS**  
of any size and shape and for any purpose.

**ST. JOHNS SPRING CO.,**  
St. Johns, - - - - Mich



**s, Sky Lights and Transoms in Churches and Schools. s,**



**ADAM'S STEEL and IRON WORKS**

Ornamental Steel Fencing, Woven Wire Fencing.  
Door and Window Guards, Bank Work, Jail Work, etc.

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**W. J. ADAM, - - Joliet, Ill.**

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**W**E have in our yard, at East Berlin, Conn., a very large stock of beams, channels, angles, plates and other structural material of high quality. We are able to furnish from this stock any ordinary bridge, building, roof or other structural work promptly and without delay. We invite correspondence.

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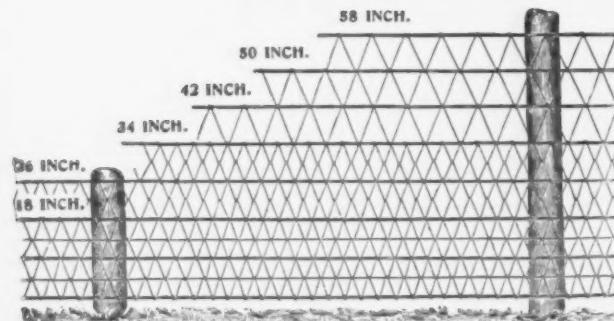
Boston Office, Room 200, Equitable Bldg.	New York Office, Room 718 Bennett Bldg., Cor. Fulton and Nassau Sts.
Philadelphia Office Rooms Nos. 909-910 Stephen Girard Building.	
Main Office and Works, East Berlin, Conn.	

# AMERICAN STEEL & WIRE CO.,

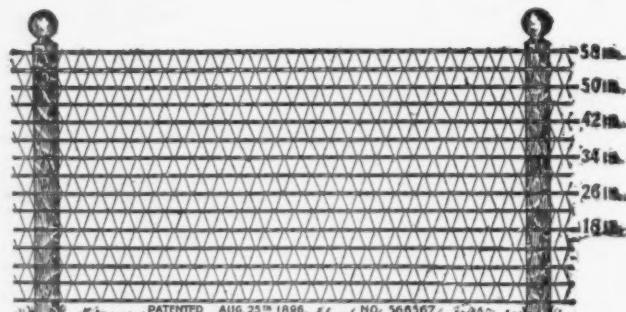
SOLE MANUFACTURERS OF THE CELEBRATED

**ELLWOOD** ALL HARD  
STEEL

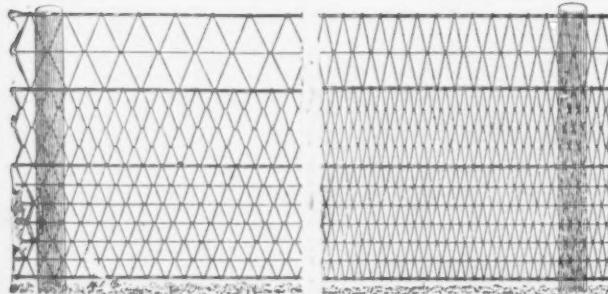
## WOVEN WIRE FENCING.



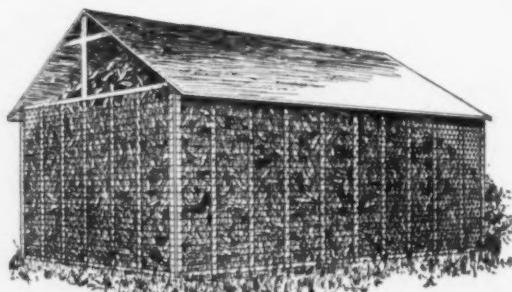
ELLWOOD FIELD FENCE (STANDARD STYLE) MADE IN SIX HEIGHTS.  
ELLWOOD FIELD FENCE. Standard Style.



PATENTED AUG. 25<sup>TH</sup> 1886. NO. 360367  
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3 inch Mesh.  
2 inch Mesh.  
ELLWOOD POULTRY AND RABBIT FENCE.



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Largest manufacturers in the world  
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Baling Wire, Bale Ties, etc.

Exclusive agency for the "Ellwood" fences given to one live,  
wide-awake dealer in every town. This agency is valuable.  
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HOOPS, AND COTTON-TIE.

WIRE-DRAWING MACHINERY---FOR STEEL, COPPER OR BRASS.

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WORCESTER, MASS., U. S. A.

MODERN  
WIRE, WIRE NAIL AND CHAIN  
PLANTS.

*Designed and built  
complete by*

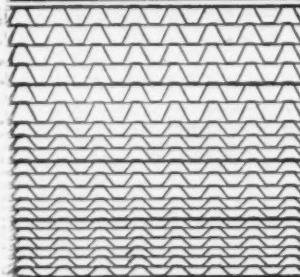
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OHIO, U. S. A.

Cable Address:  
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Patented July 21, 1896 and July 6, 1897

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### A Fence, Not a Netting.

Its multitude of horizontal wires gives it strength, makes it easy to erect and keeps it in good shape.

### 50% Saving to the User.

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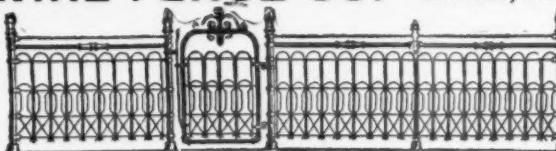
DE KALB FENCE CO., 327 High St., DE KALB, ILL.

## DWIGGINS WIRE FENCE CO. Anderson, Ind.

Wire Fencing, Ready Made,  
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Lawn, Farm and Railroad.

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Agents Wanted.



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STERLING, ILL.

Manufacturers of  
Barbed Wire Staples.

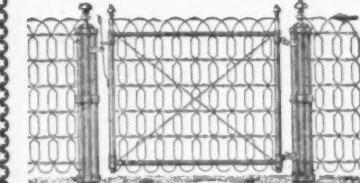
Steel Wire Nails.  
Steel Bale Ties.

Annealed, Bright  
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Market Wire.

Weaving Wire Fence

Copper, Iron and  
Steel Rods.

Special Wires and  
Wire Straightened  
and cut to length.



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10,000 feet erected in Lincoln Park. Handsome, Durable and Cheap. Never sags or gets loose. Live Agents wanted in every County. Also Mfrs. Wire Stock Fencing, Bale Ties, Nails. Write for Catalogue.

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If you have a building that needs a

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Write us for prices giving particulars. Also Mfrs. of Ornamental Iron and Wire Work, Grills, Brass Work, Elevator Enclosures, Iron Shutters, Jail Cells, etc.

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Hard Coiled Galvanized Steel Wire for Fencing.



We make and sell in the roll to the hardware trade Hard Galvanized Coiled Wire for farm fence purposes. Has twice the strength of soft wire; the coil particularly provides for expansion and contraction, and costs about the same as the soft.

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WIRE FENCE. COILED WIRE. STEEL GATES.

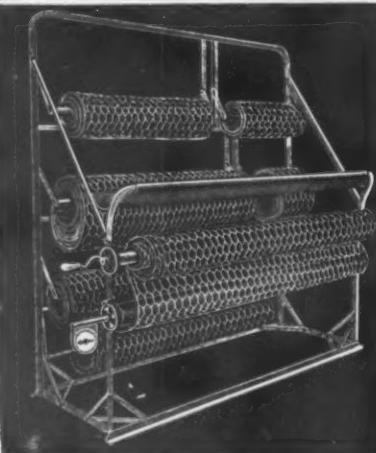
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Bessemer and Open Hearth Steel.

**GRAND CROSSING TACK CO.,  
GRAND CROSSING, CHICAGO, ILLS., U. S. A.**

ALSO MANUFACTURERS OF RIVETS, STAPLES, STANDARD AND MISCELLANEOUS WIRE NAILS, TACKS AND SHOE NAILS.

"TALLY-HO"  
Display Rack  
AND  
MEASURING MACHINE,  
arranged for conveniently measuring,  
winding and handling  
POULTRY NETTING.



Patented in U. S. and Canada.  
No longer an experiment. Hundreds are  
now being successfully used. Sold by all  
leading wholesale hardware dealers. Write  
for prices and testimonials.

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Manufacturer,  
BATAVIA, ILLS.



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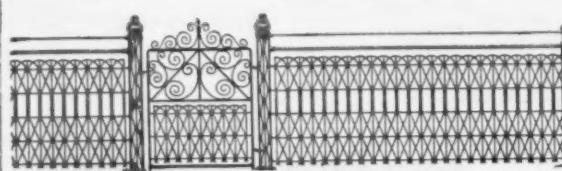
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WINDOW GUARDS,  
OFFICE RAILING,  
TREE GUARDS,  
FARM FENCE.

Send for Catalogue and  
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# ROLLED THREADSCREWS. UNEXCELLED

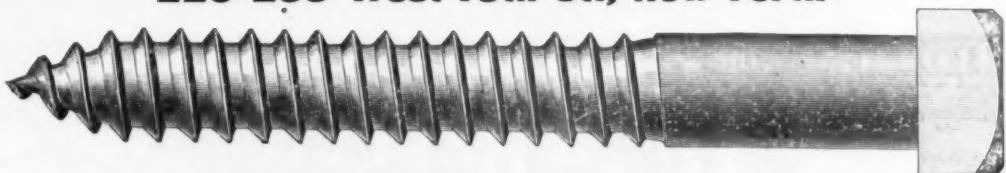
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229-233 West 10th St., New York.

Established 1839.



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Machine Bolts, Lag Screws, Washers.

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Wire Drawing Machinery, Flange and Compression Couplings, Hangers and Pillow Blocks, Pulleys and Shafting, Power Transmission Machinery, Air Compressors.



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Wire Straightened and Cut to lengths. Wire,  
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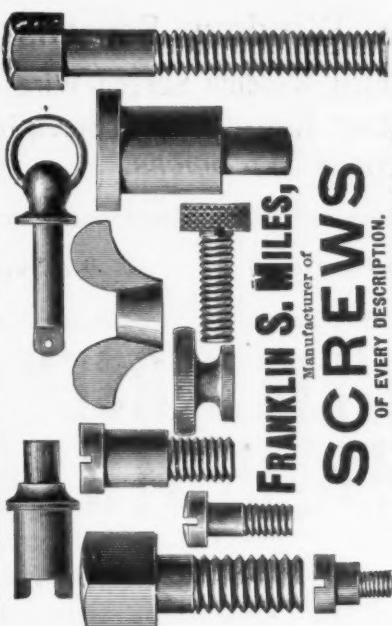
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Special Machine Screws, Studs, Bolts, &c.

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WIRE and CUT NAIL MACHINES,  
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Joins together perfectly.  
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Absolutely watertight.

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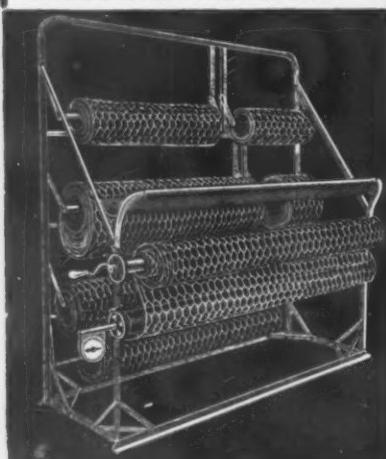
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Bessemer and Open Hearth Steel.

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**GRAND CROSSING, CHICAGO, ILLS., U. S. A.**

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"TALLY-HO"  
**Display Rack**  
 AND  
 MEASURING MACHINE,  
 arranged for conveniently measuring,  
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Patented in U. S. and Canada.  
 No longer an experiment. Hundreds are now being successfully used. Sold by all leading wholesale hardware dealers. Write for prices and testimonials.

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LAWN FENCE,  
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# ROLLED THREAD SCREWS. UNEXCELLED

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MANUFACTURERS OF  
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Single Loop

STEEL WIRE BALE TIES.

Wire Straightened and Cut to lengths. Wire,  
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Special Machine Screws, Studs, Bolts, &c.

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MAKERS OF WIRE and CUT NAIL MACHINES,  
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and Wire Flattening Machinery.

Conductor Pipe.

Joins together perfectly.  
Uniform in size.  
Absolutely watertight.

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We Manufacture a Complete Line of these Goods, Including

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**WIRE CLOTH, NETTING.** The **Gilbert & Bennett Mfg. Co.** WIRE GOODS, WIREWORK.

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Made from Hard Drawn Bronze Wire.

Made from Hard Drawn Galvanized Steel Wire.

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For all Purposes

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From BRASS, COPPER, STEEL, IRON, GALVANIZED, TINNED and BRONZE WIRE

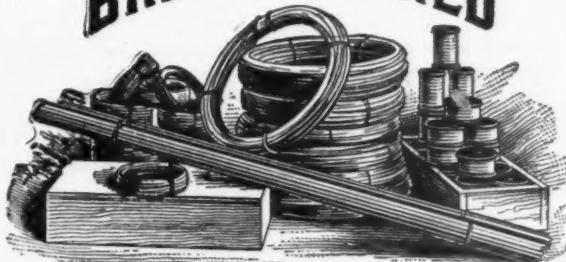
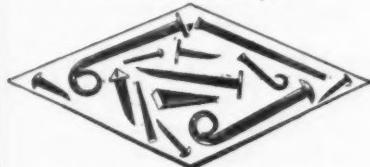
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GEO. W. PRENTISS &amp; CO., - HOLYOKE, MASS.

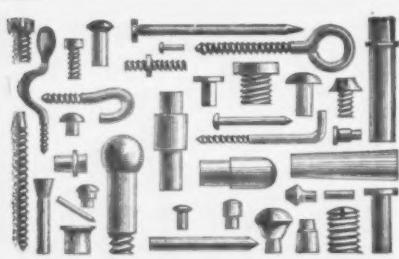
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for  
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**IT IS A WONDER!!**Guaranteed Increase 25% in Speed!  
**KIMBALL BROS. & SPRAGUE.**  
**BROCKTON, MASS.**

1880.

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Plymouth, Mass.

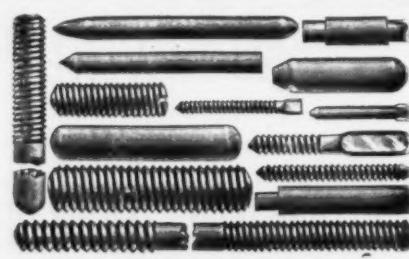


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STUDS, PINS, SCREWS, &c.,

For Manufacturers of Light Hardware.

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WATERBURY, CONN.

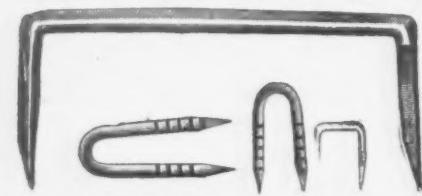


**GRAND CROSSING TACK CO.,** Grand Crossing, Chicago, Ill., U. S. A.



RIVETS,  
STAPLES,  
WIRE NAILS,  
SHOE NAILS  
TACKS.

**E. H. Titchener & Co.,**  
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Have made STAPLES



For fifteen years.

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**Milwaukee Tack Co.,**  
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TACKS,  
NAILS,  
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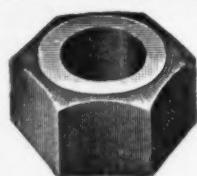
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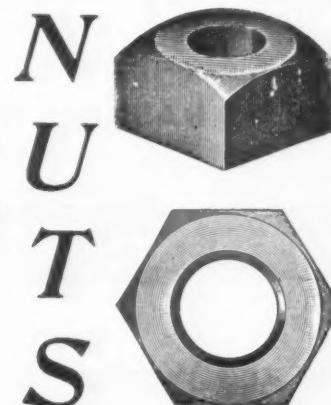


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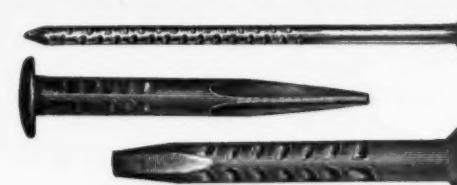
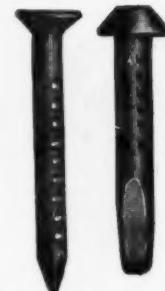
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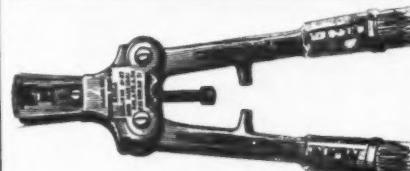


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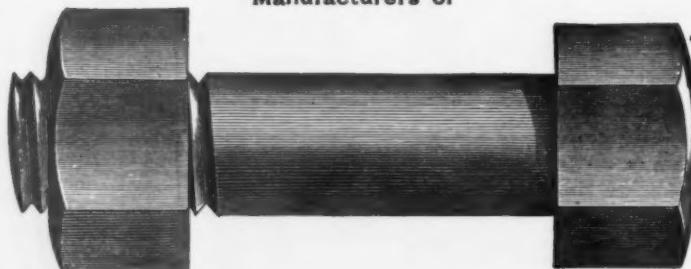
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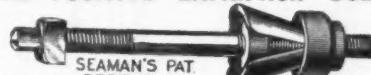
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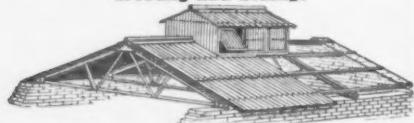
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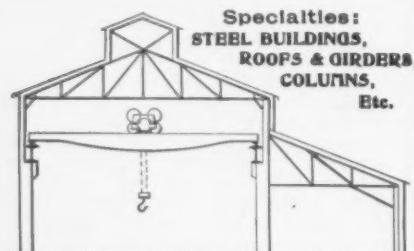
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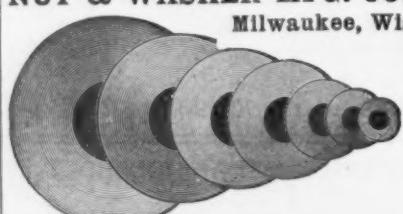
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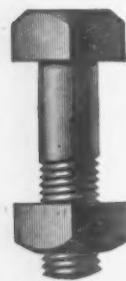
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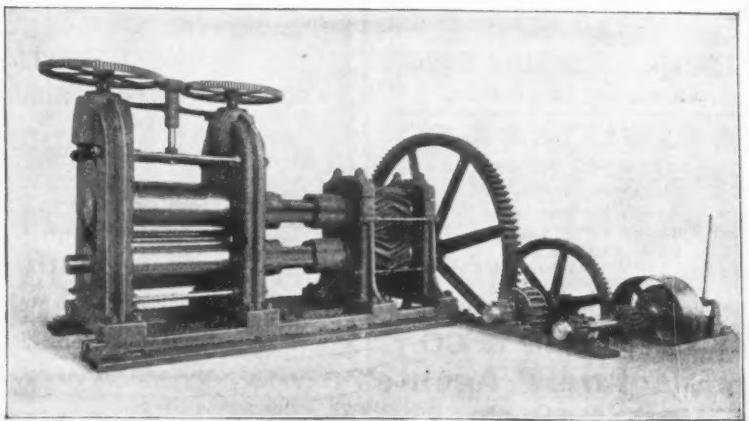
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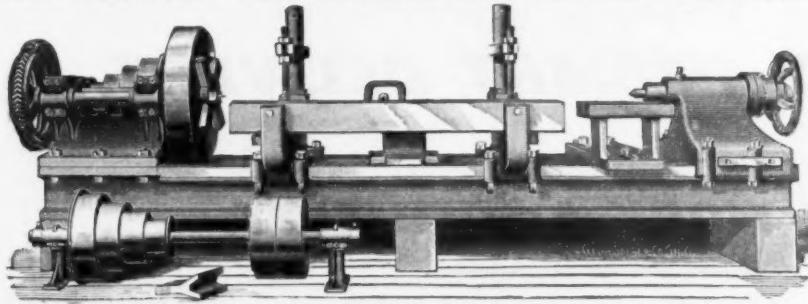
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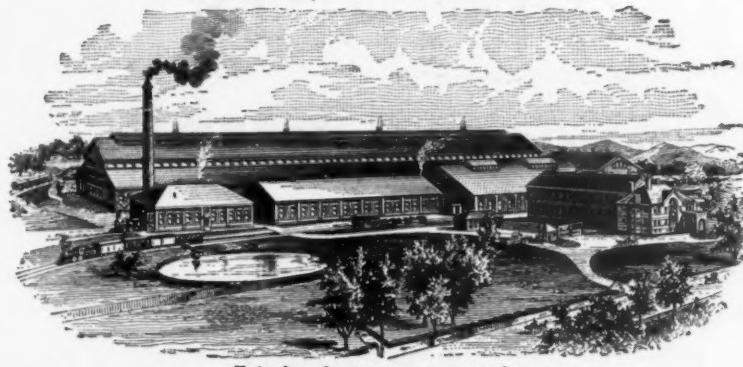
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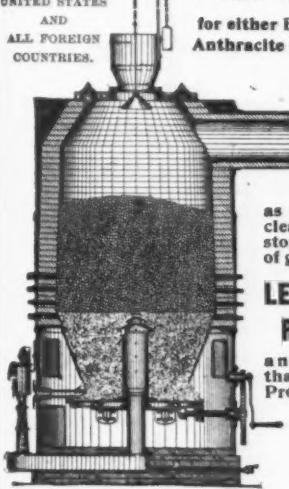
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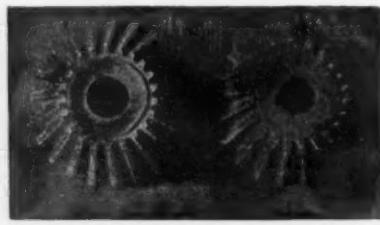
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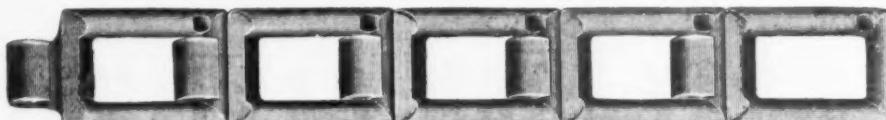
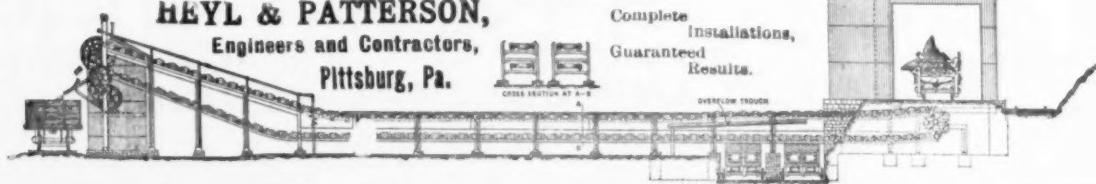
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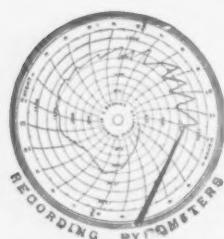
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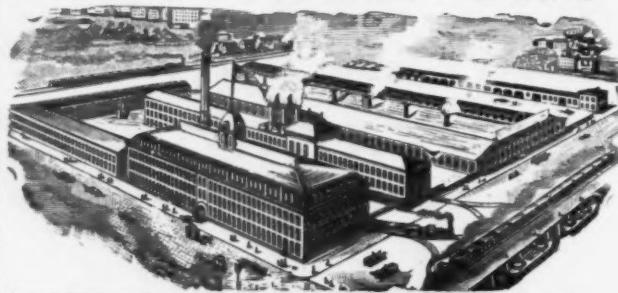
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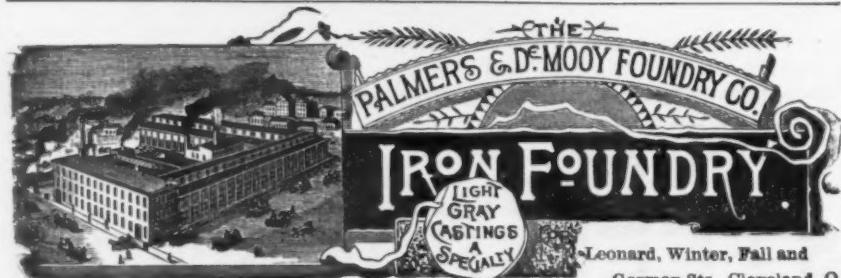
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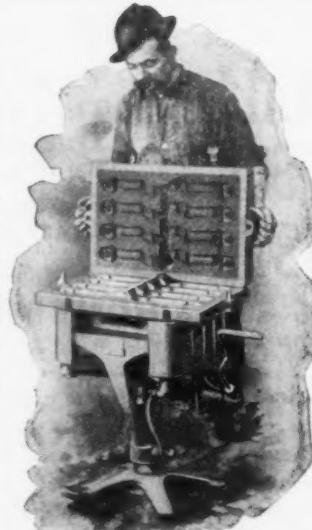
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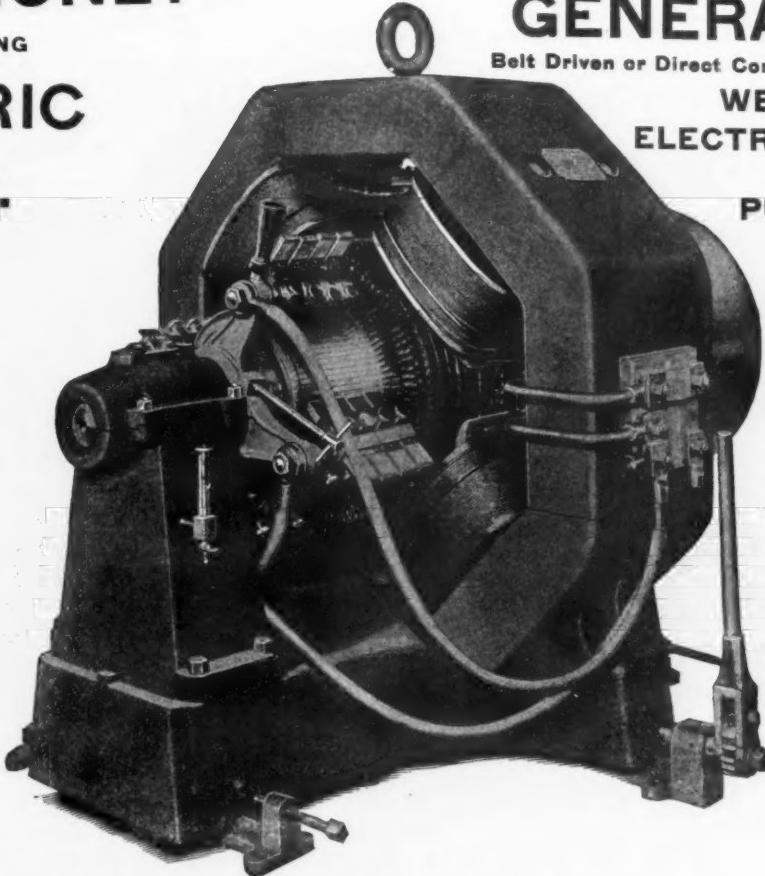
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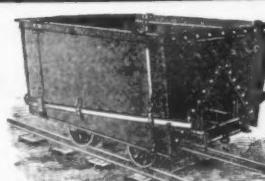
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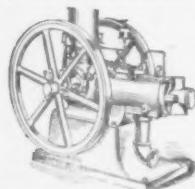
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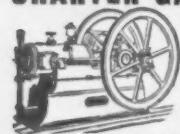
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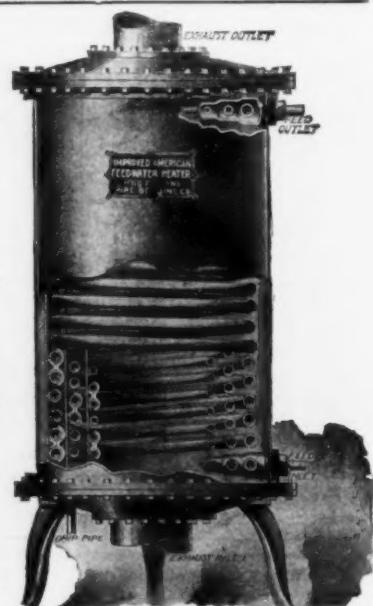
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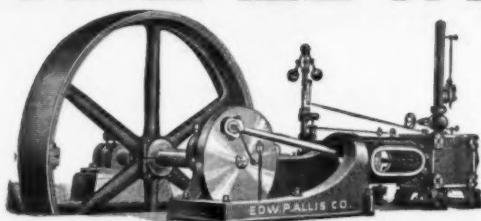
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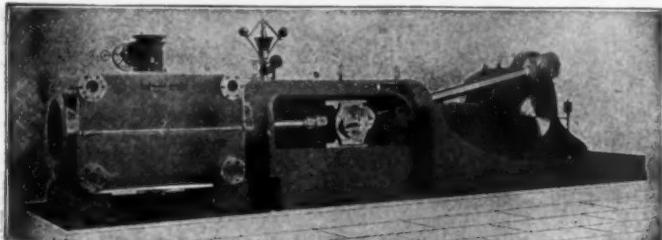
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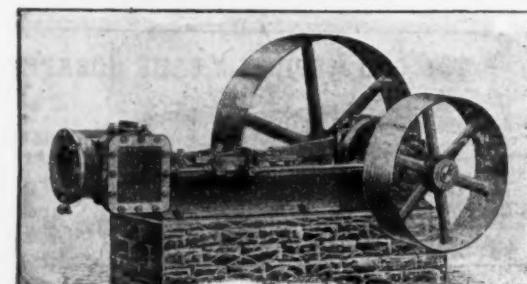
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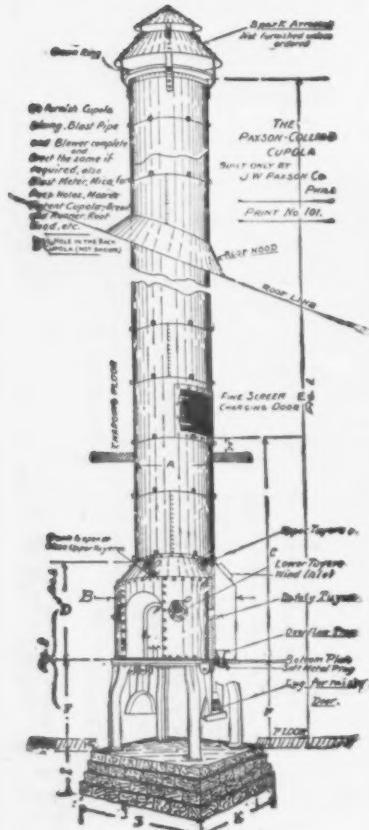
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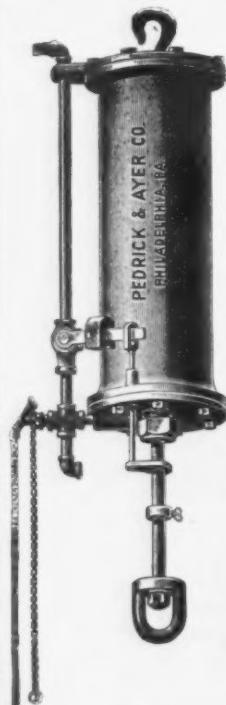
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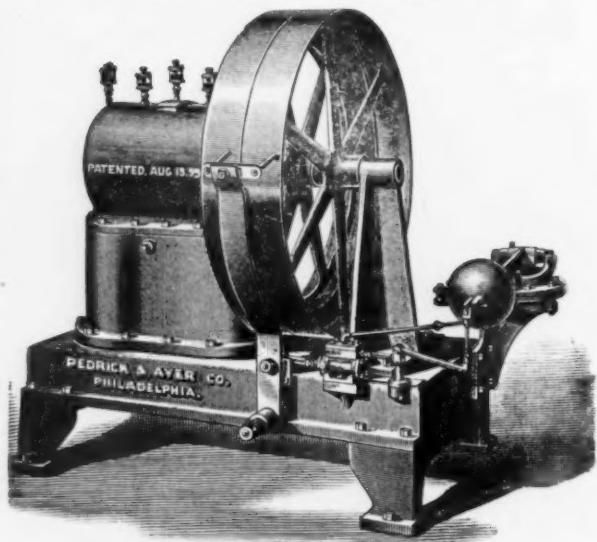
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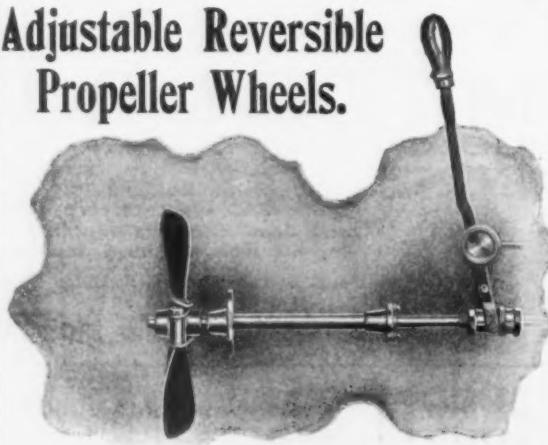
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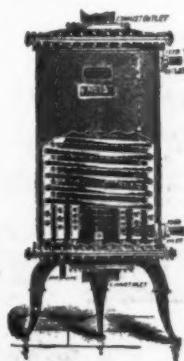
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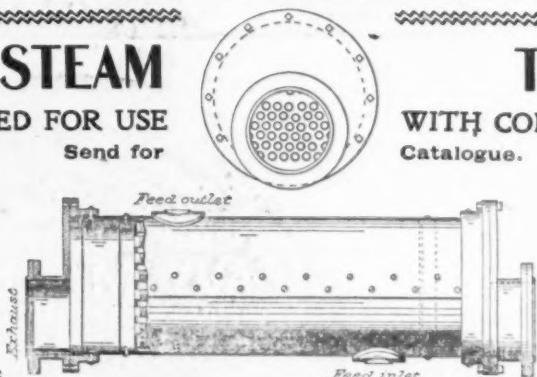
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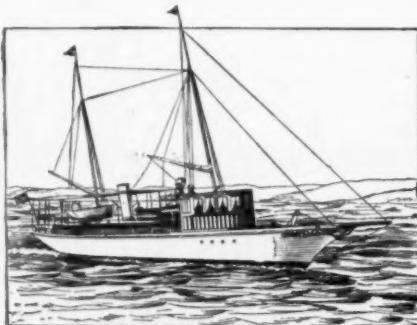
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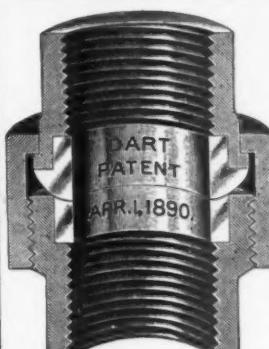
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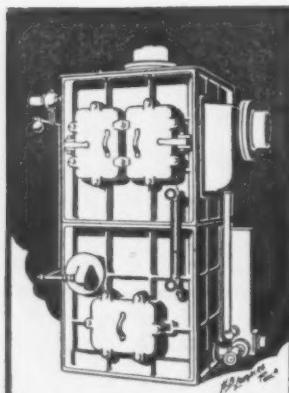
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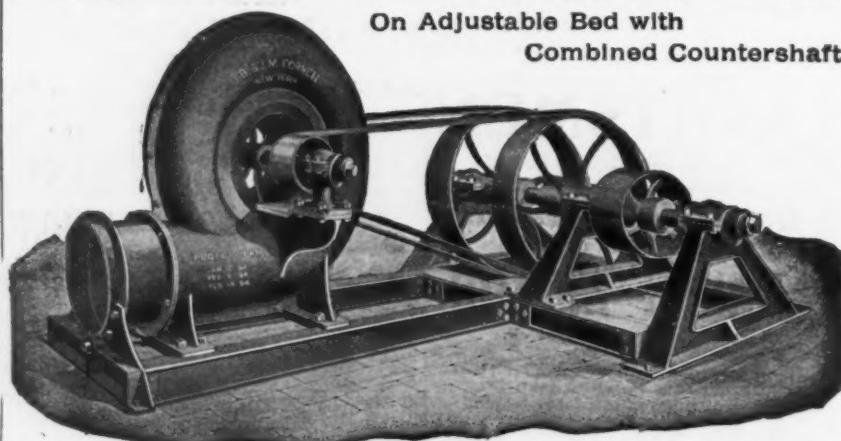
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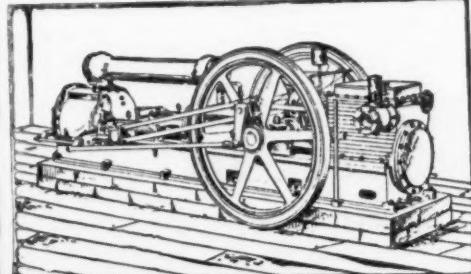
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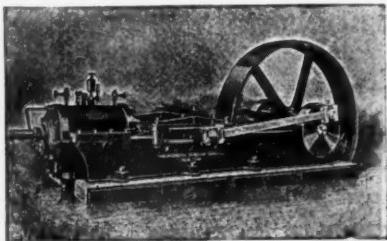
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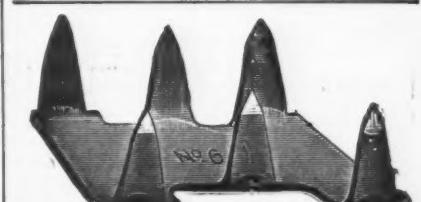
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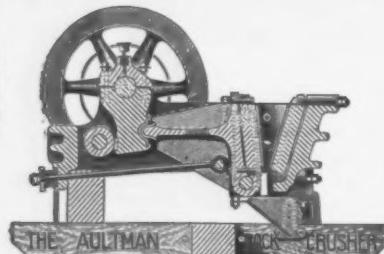
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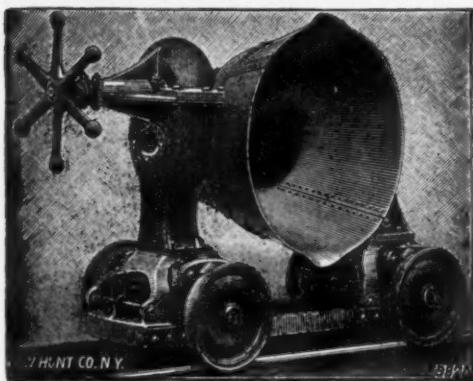
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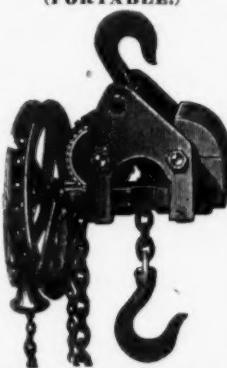
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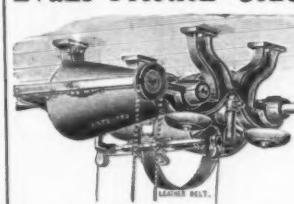
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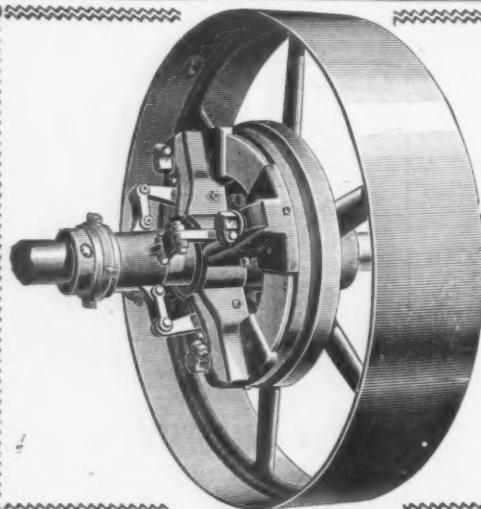
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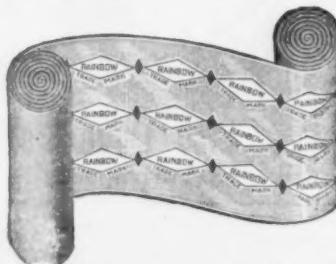


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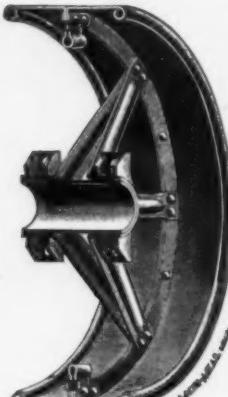
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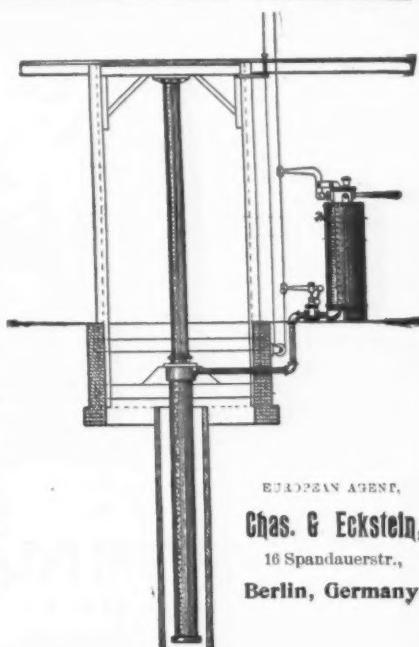
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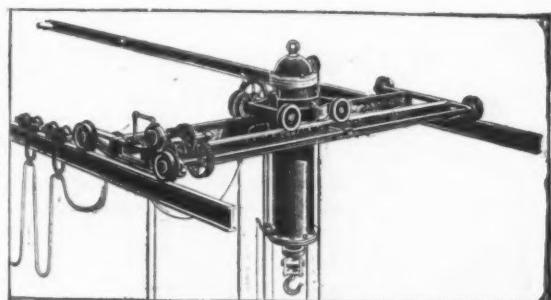
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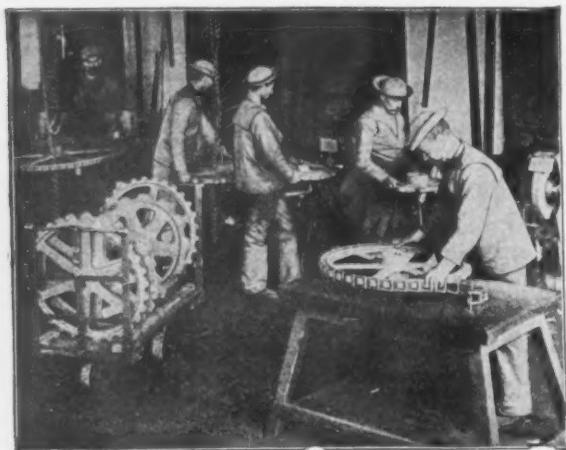


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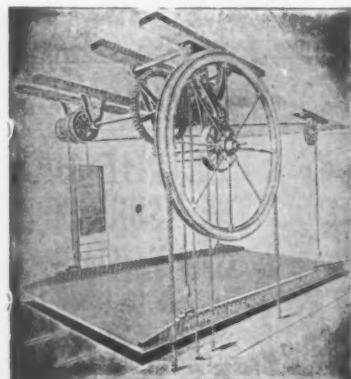
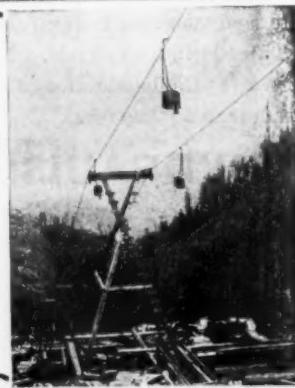
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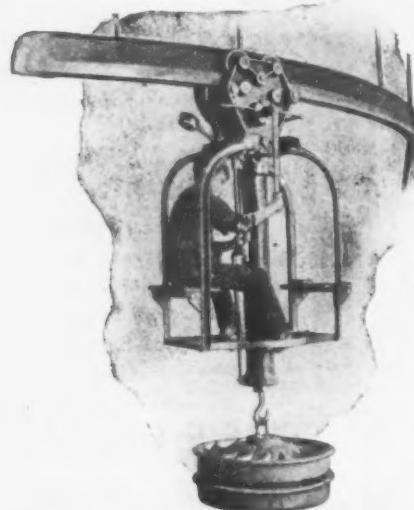
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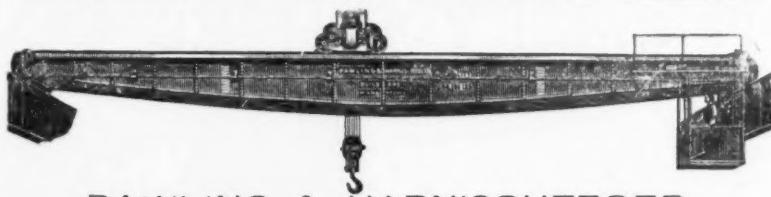
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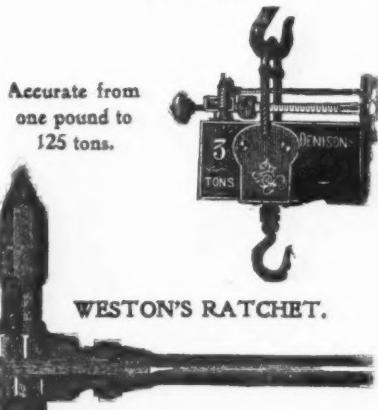
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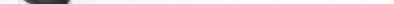
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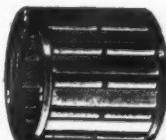
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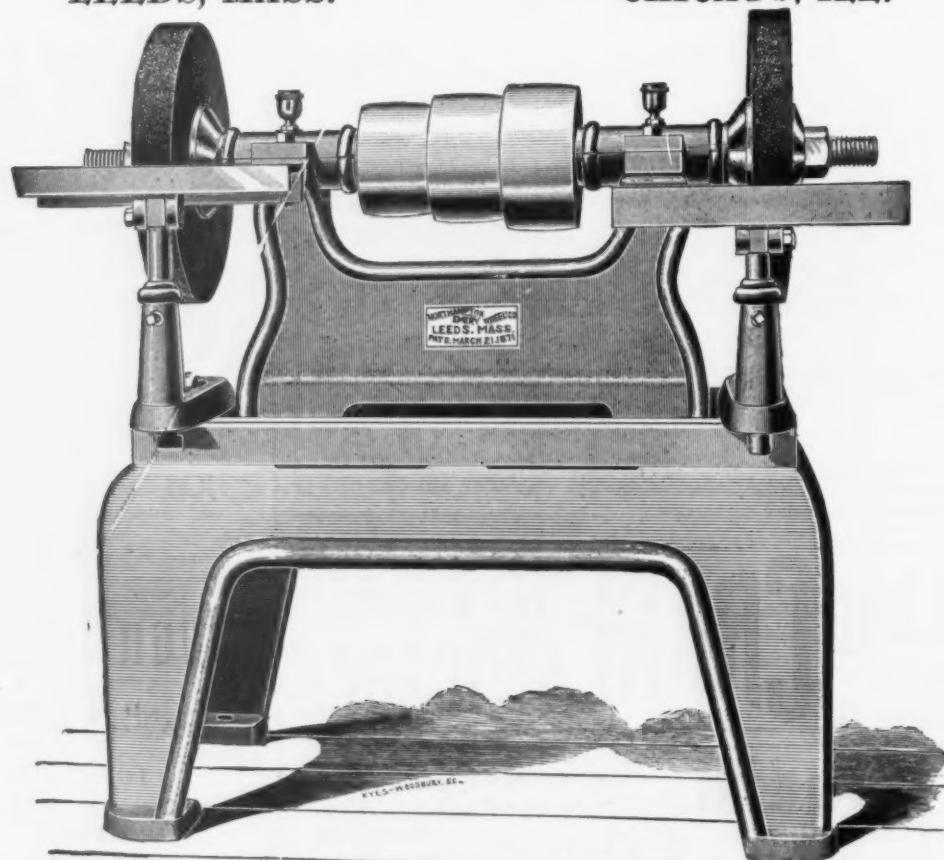
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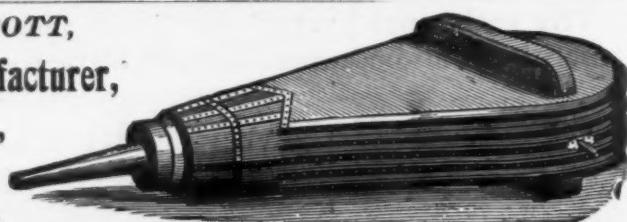
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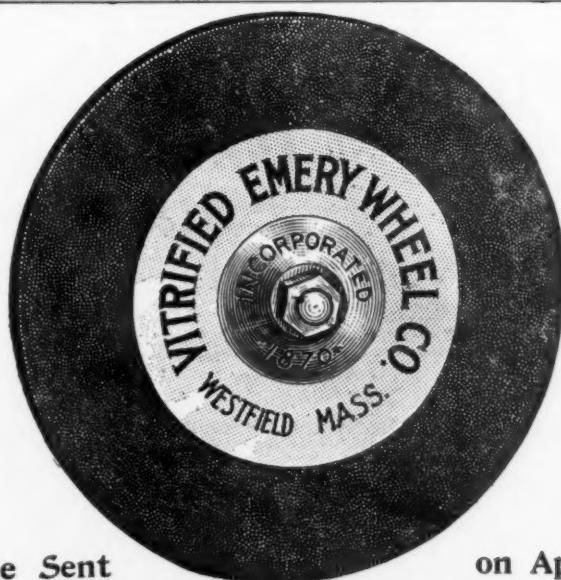


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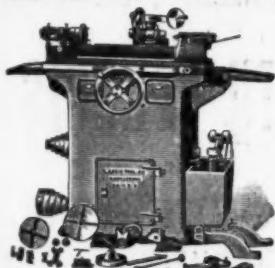
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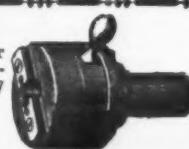
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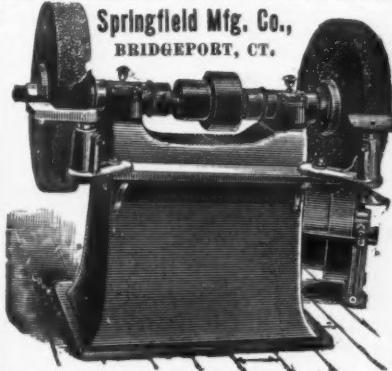
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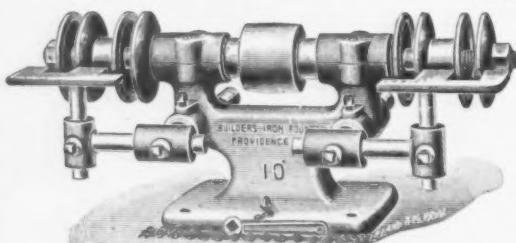
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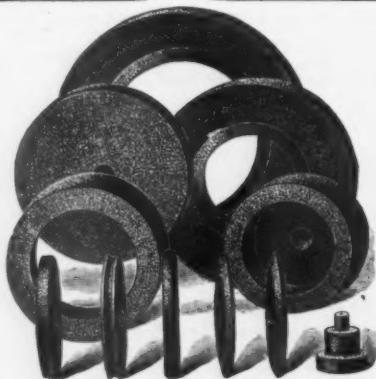


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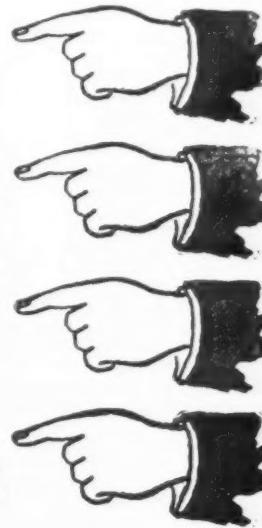
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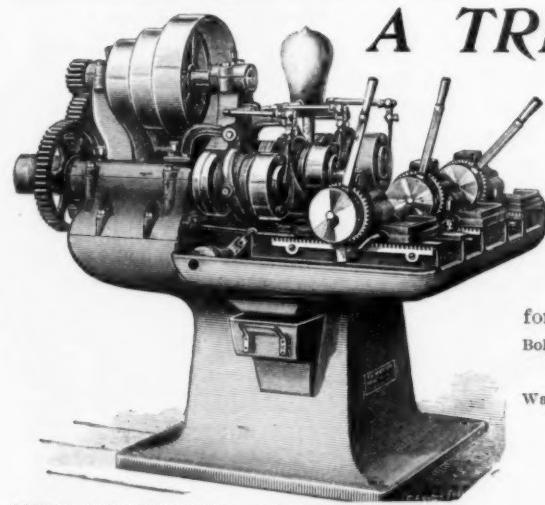


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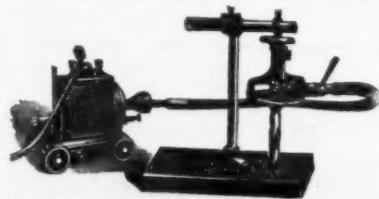
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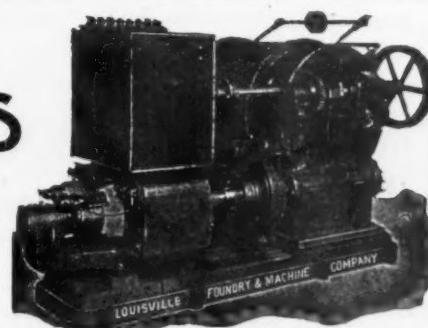
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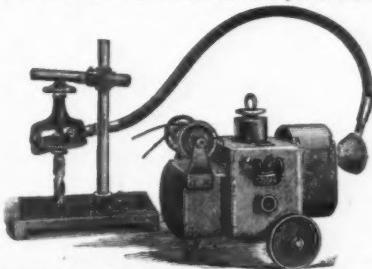
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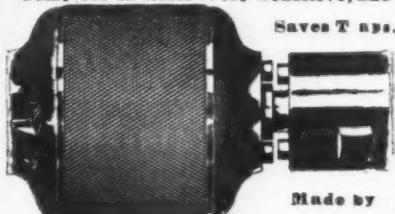
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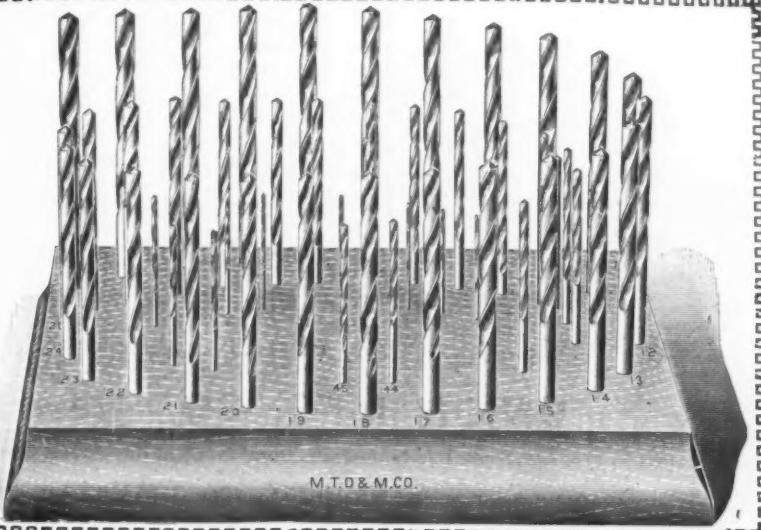
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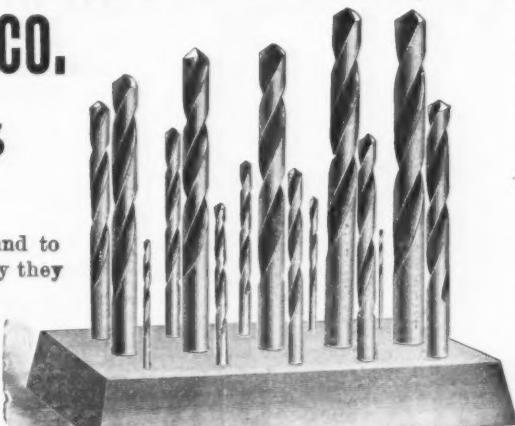
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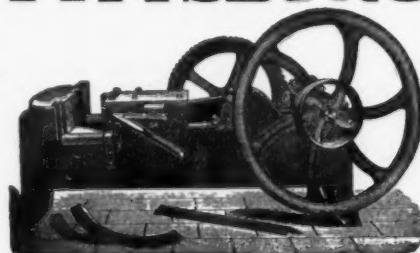
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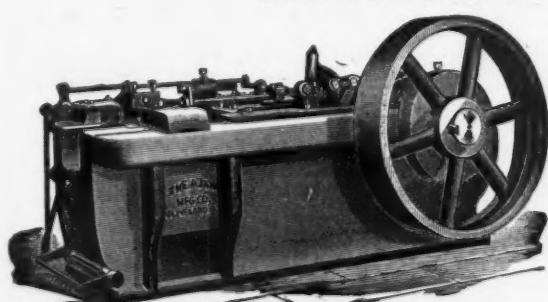
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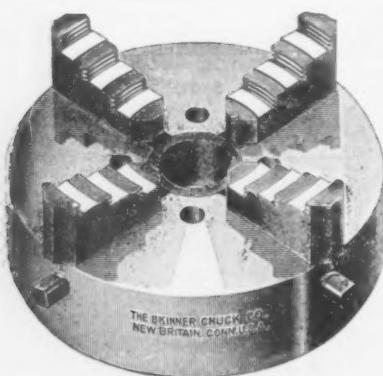
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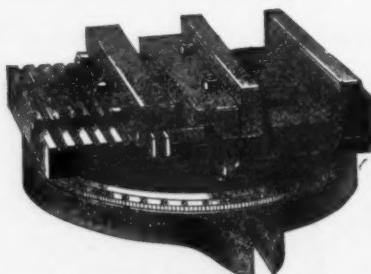
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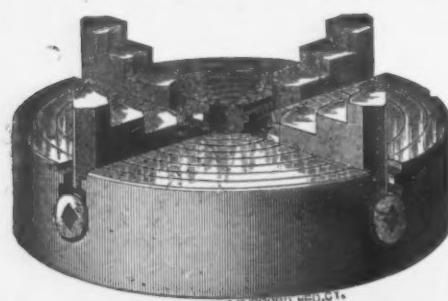
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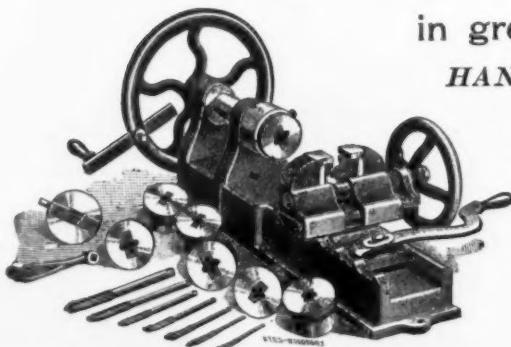
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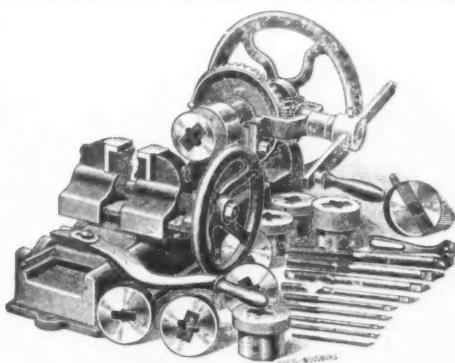


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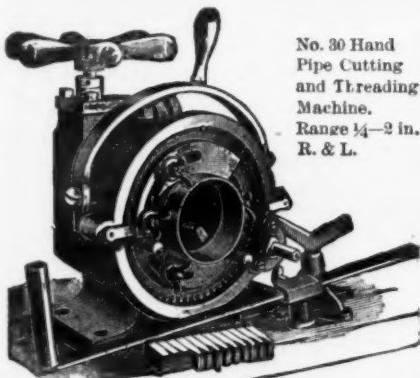


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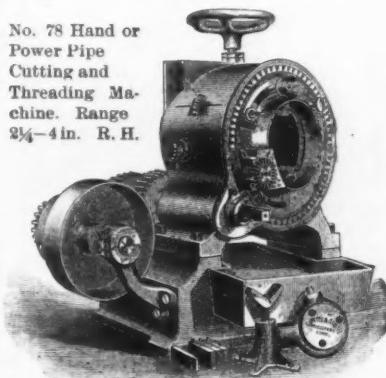
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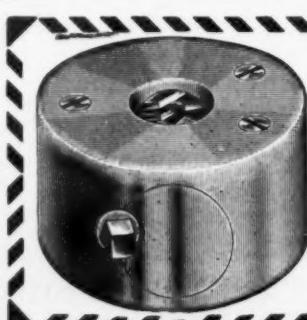
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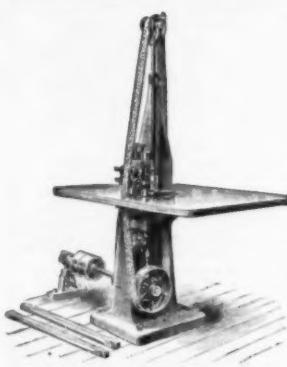
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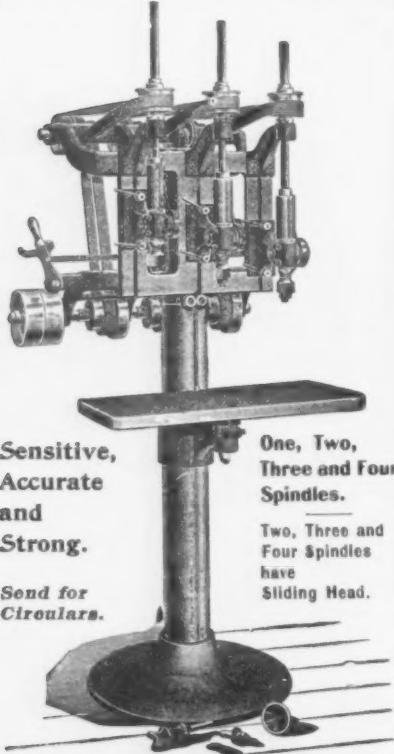


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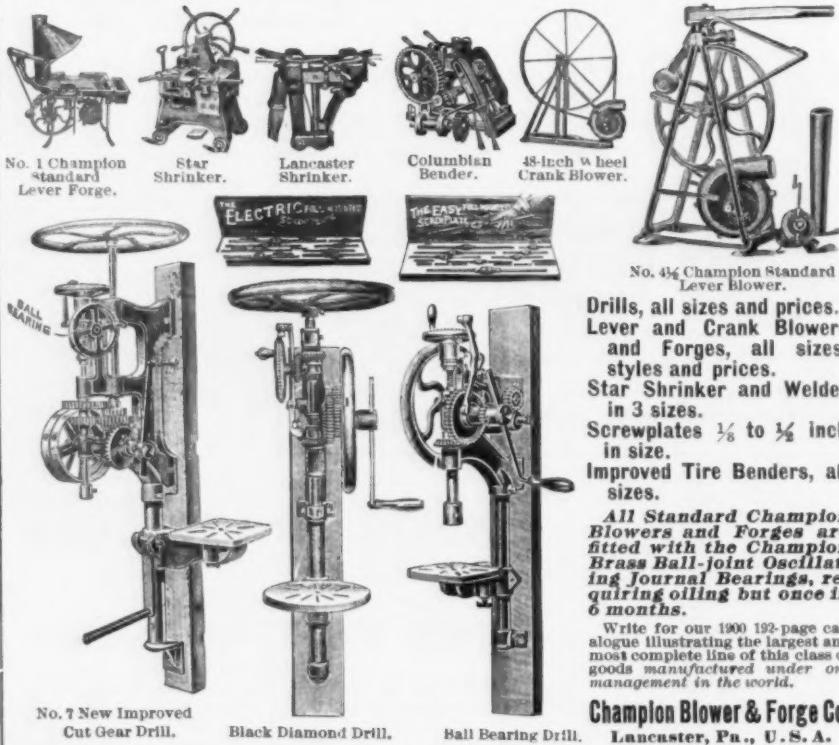
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Drills, all sizes and prices.  
Lever and Crank Blowers and Forges, all sizes, styles and prices.  
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Screwplates  $\frac{1}{8}$  to  $\frac{1}{2}$  inch in size.  
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BACK GEAR, - - WHEEL-FEED  
Automatic Stop and Quick Return Lever.

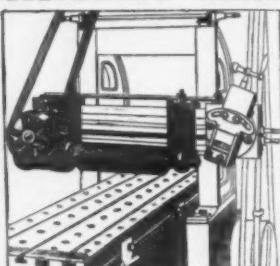
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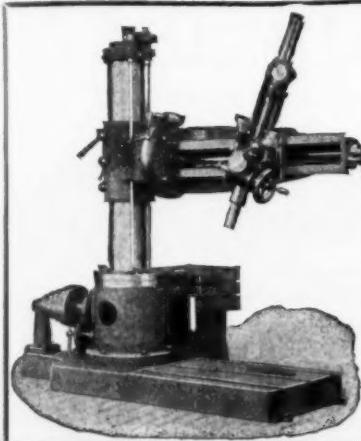


Combined with any Iron Planer  
Swivels from horizontal to vertical. Do not plane surfaces that should be milled, or mill surfaces that should be planed.

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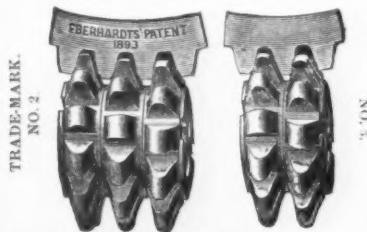
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2 to 10 teeth finished at once.

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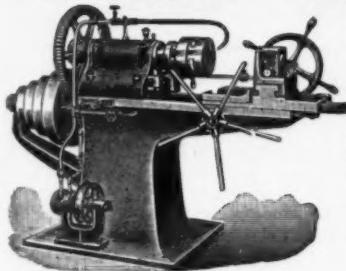
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1, 2 or 3 Splindles.

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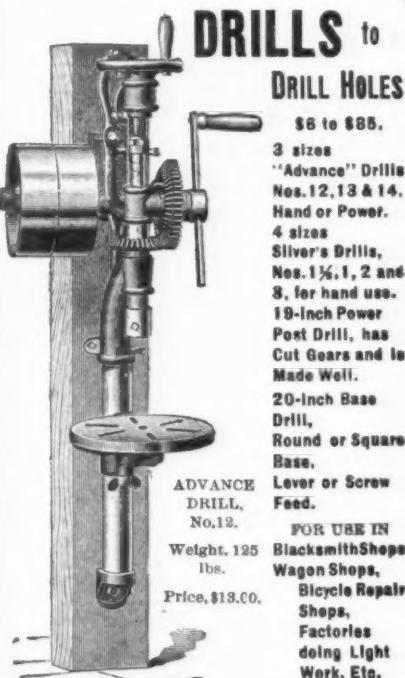
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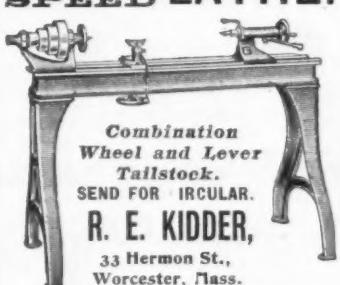
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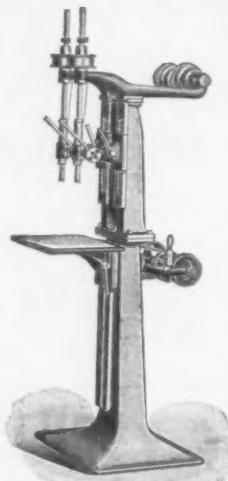


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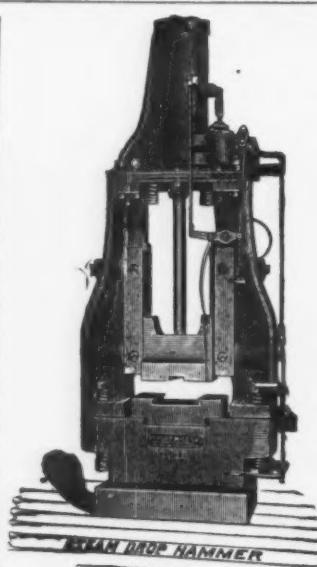
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2, 3, 4 and 6 Spindles

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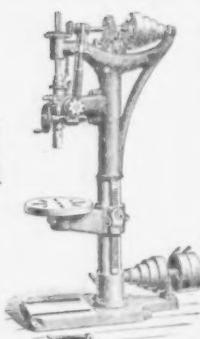
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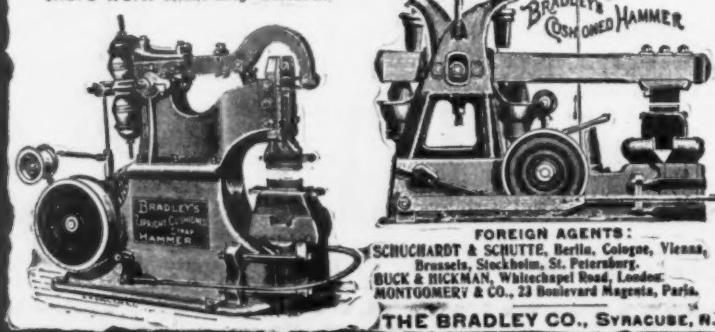
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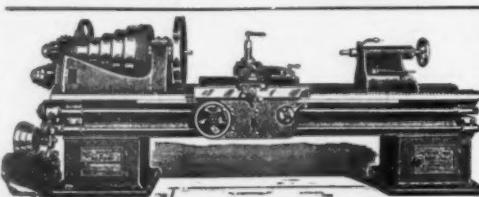
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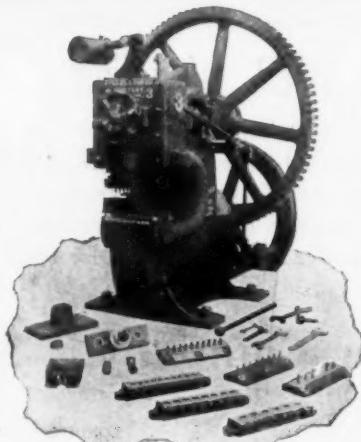
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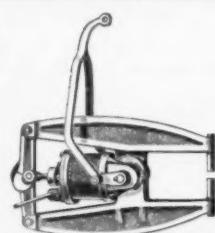


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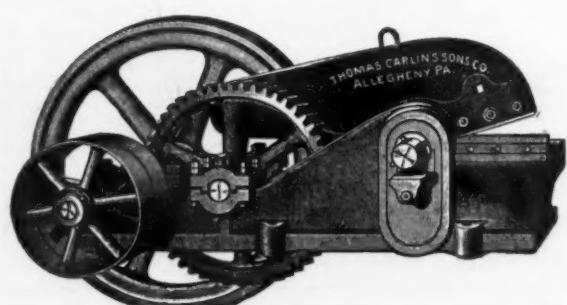
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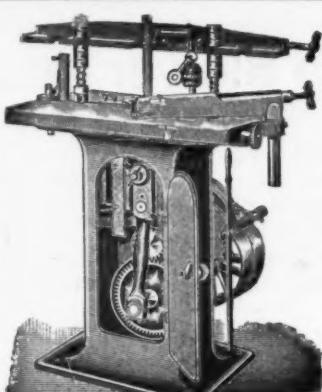
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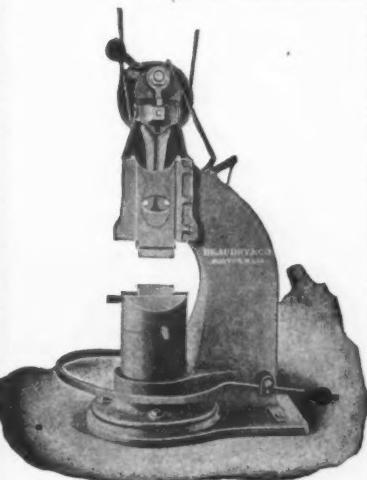
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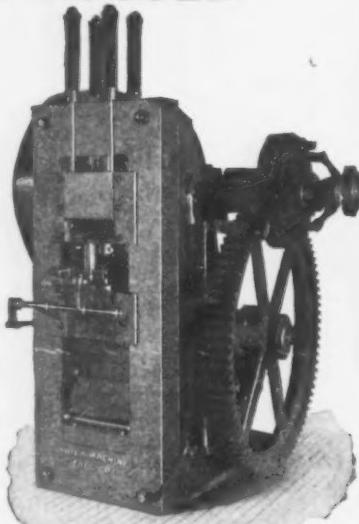
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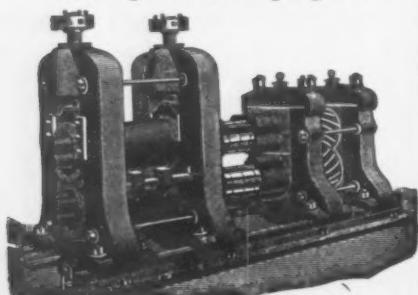
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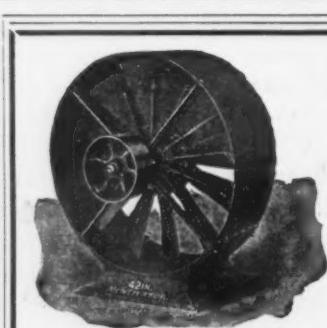
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Will send our fans to compete with any other manufacturer,  
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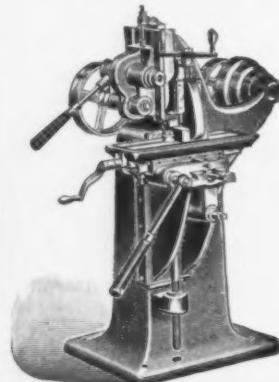
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WRITE US  
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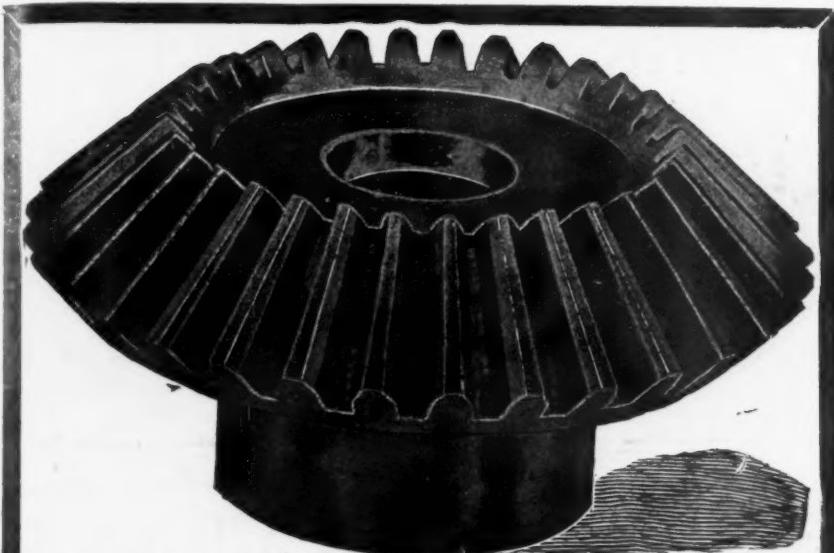
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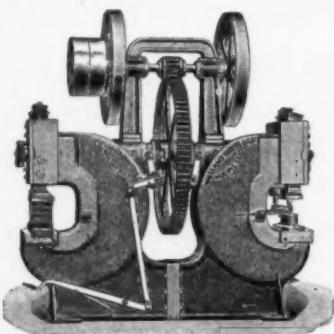
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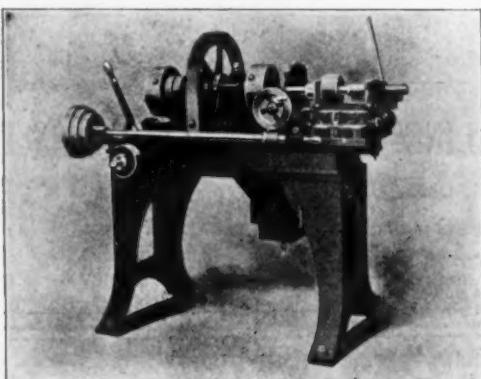
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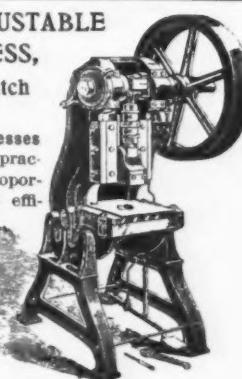
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Power Punching Presses  
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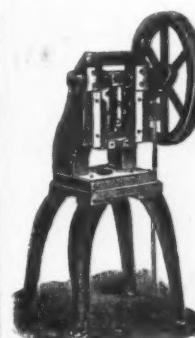
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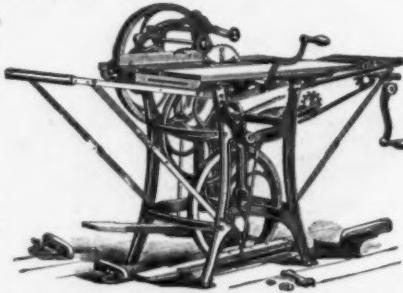
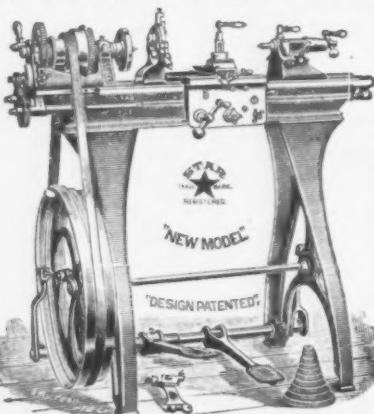
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**For Wood and Metal Workers.**

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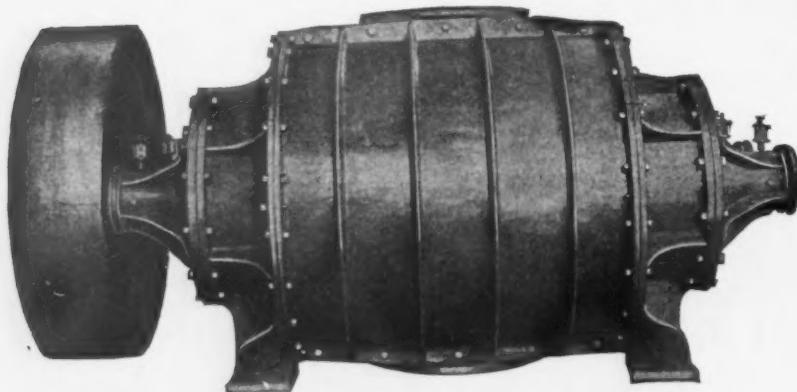
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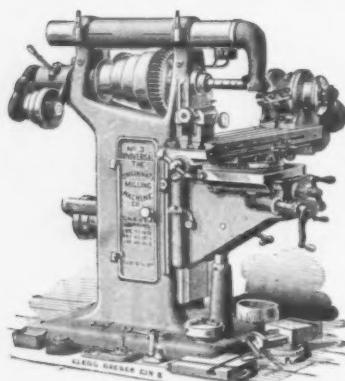
And it weighs less, occupies less space,  
and is more positive in action than any  
other blower.

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you've been using one kind of Miller for years is no reason  
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Adolph Janssens, Paris.  
Chas. Churchill & Co., Ltd., London, Birmingham, Manchester, Glasgow.  
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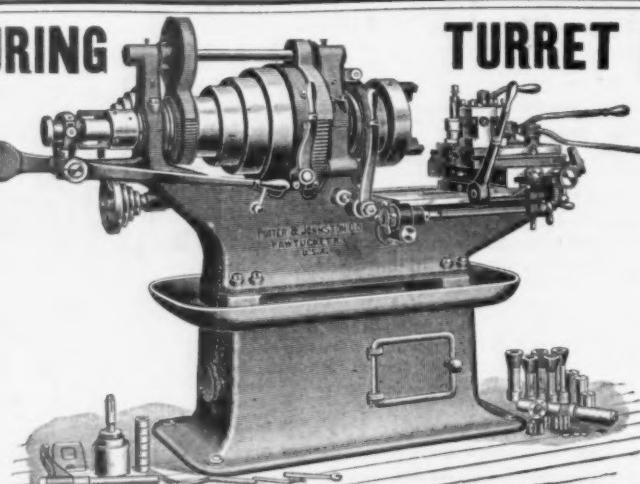
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## TURRET LATHE.

THIS Lathe is made in a  
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work ordinarily done on en-  
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chines.

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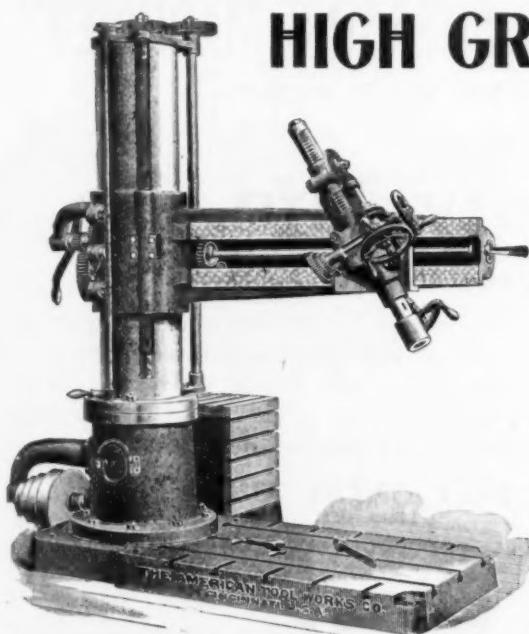
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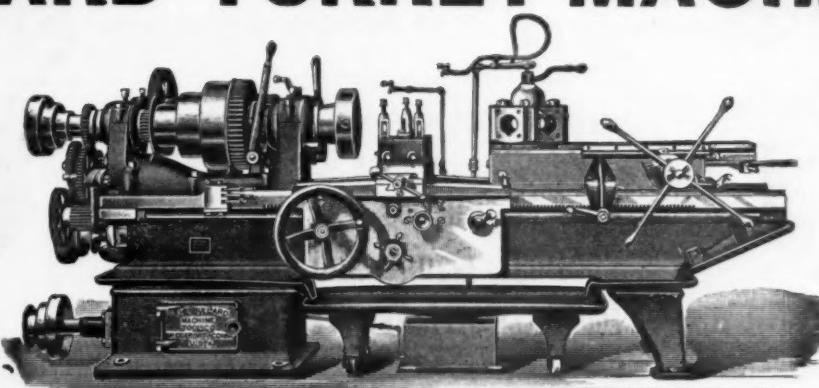
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Also  
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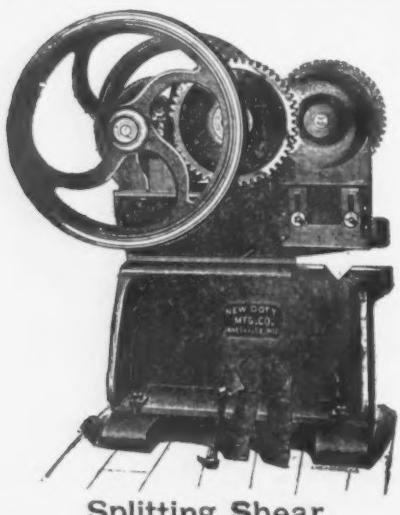
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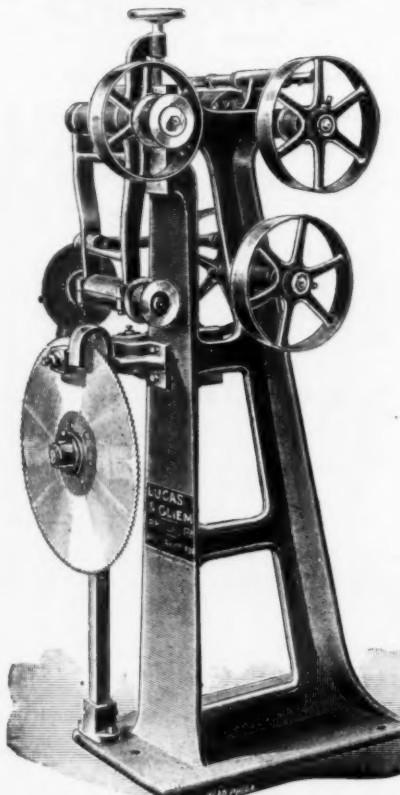
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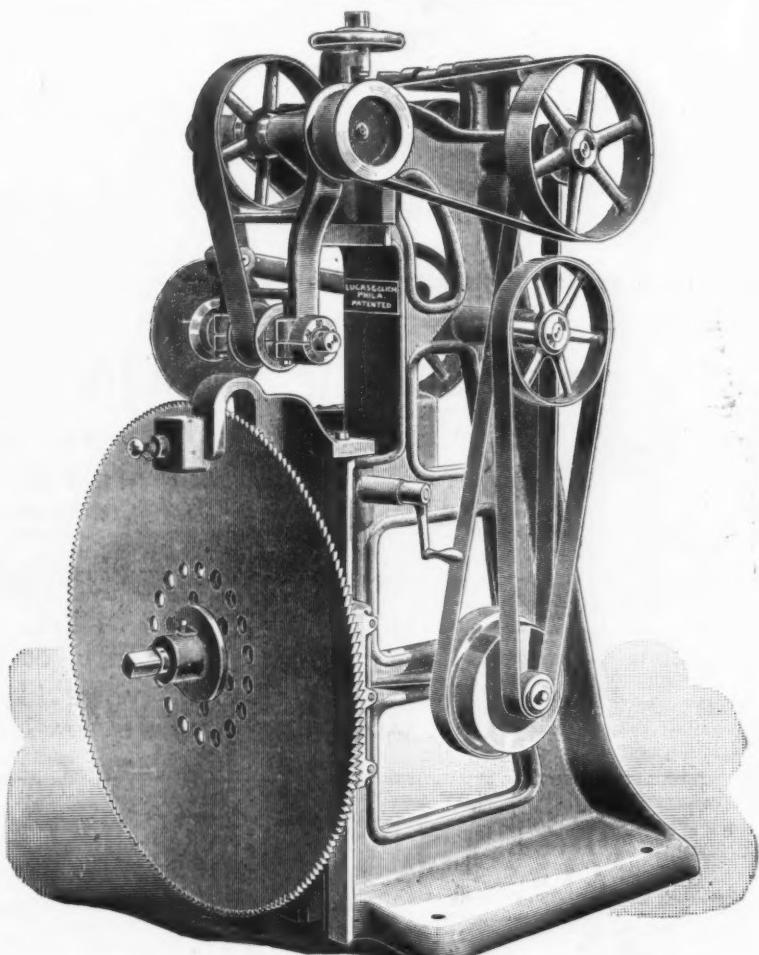
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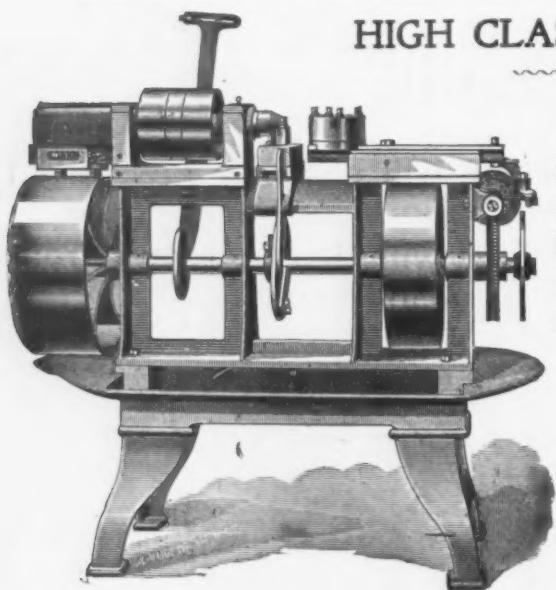
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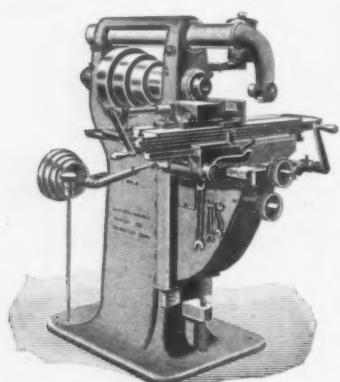
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IS DESIGNED MORE ESPECIALLY FOR  
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We have used plenty of metal and have distributed same with the idea of insuring strength and rigidity where most needed.

There are many good points about this machine which are explained in our descriptive circular, which will be sent upon application.

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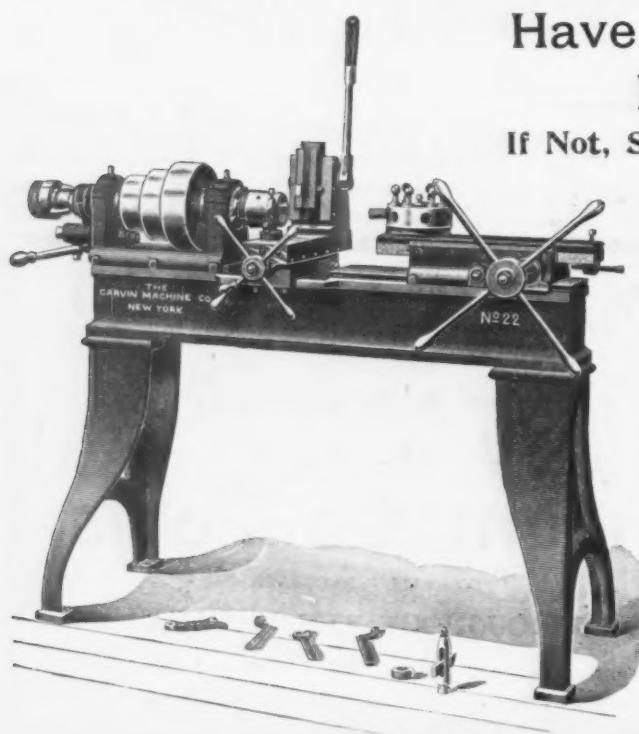
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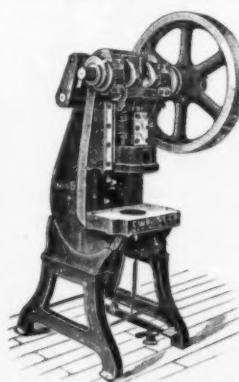
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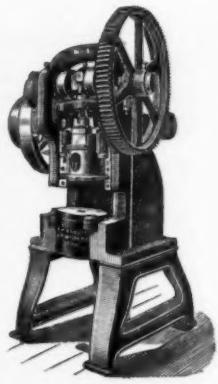


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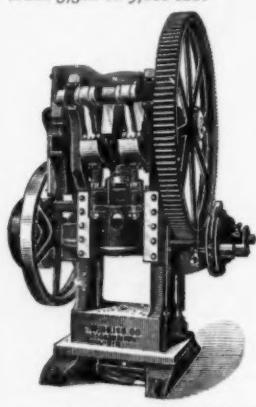
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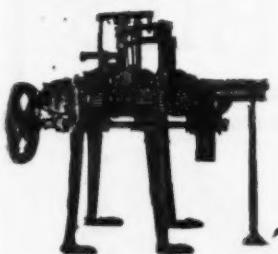
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This difficult piece was made on the machine



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or any kind of special machinery  
for rapid work . . . .

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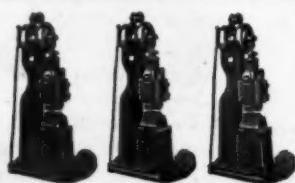
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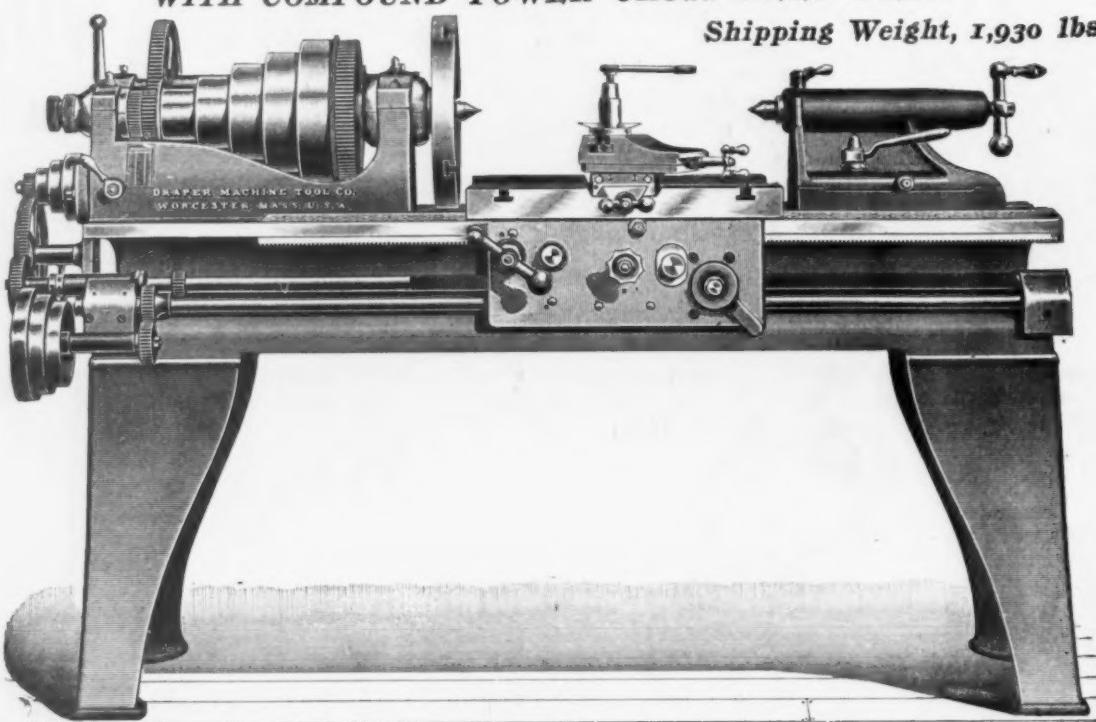


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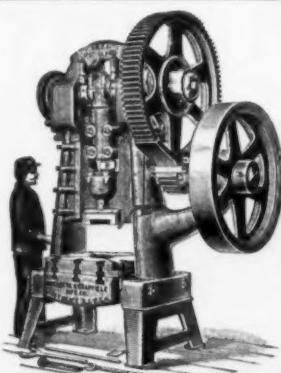
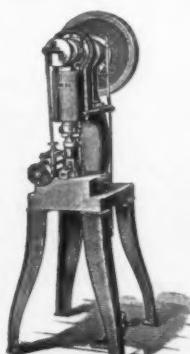
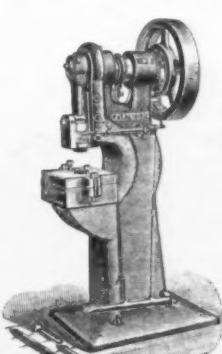
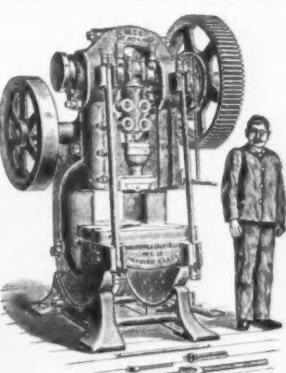
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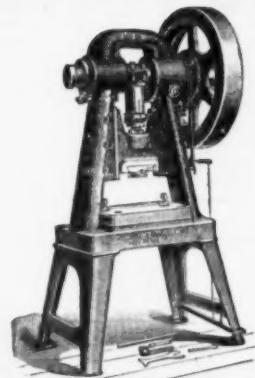
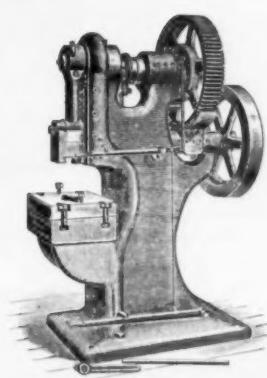
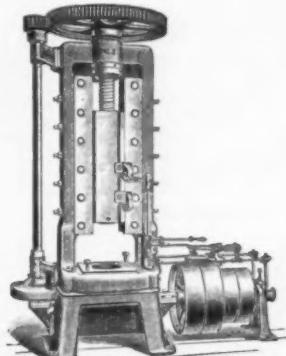
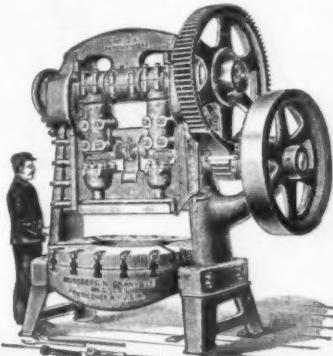
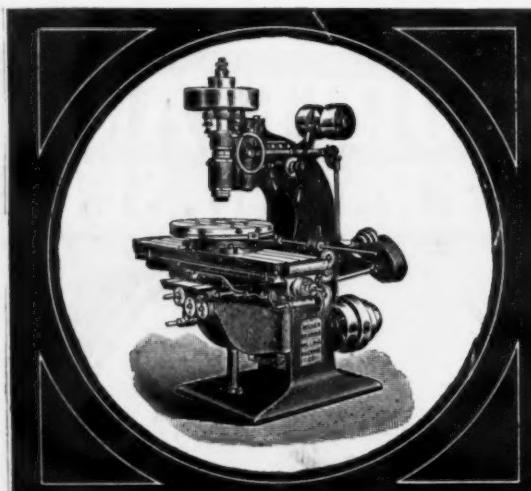
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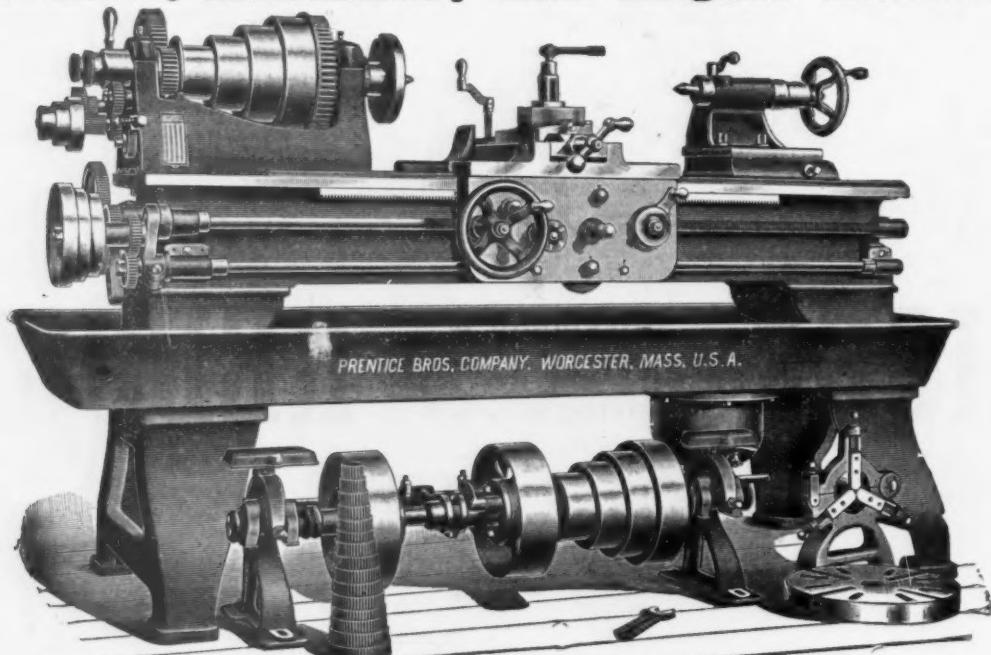
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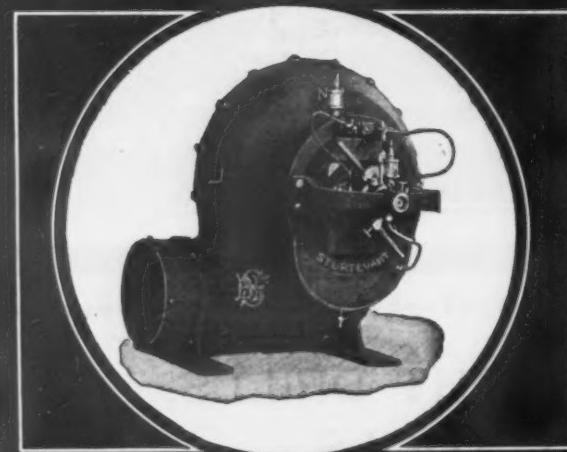
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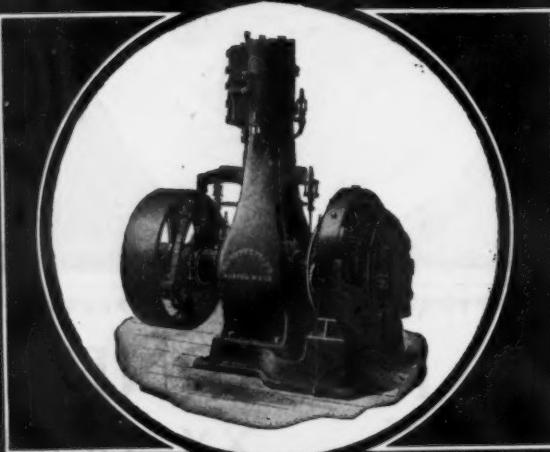
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*In 100 types and sizes.  
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We build both fan and motor.  
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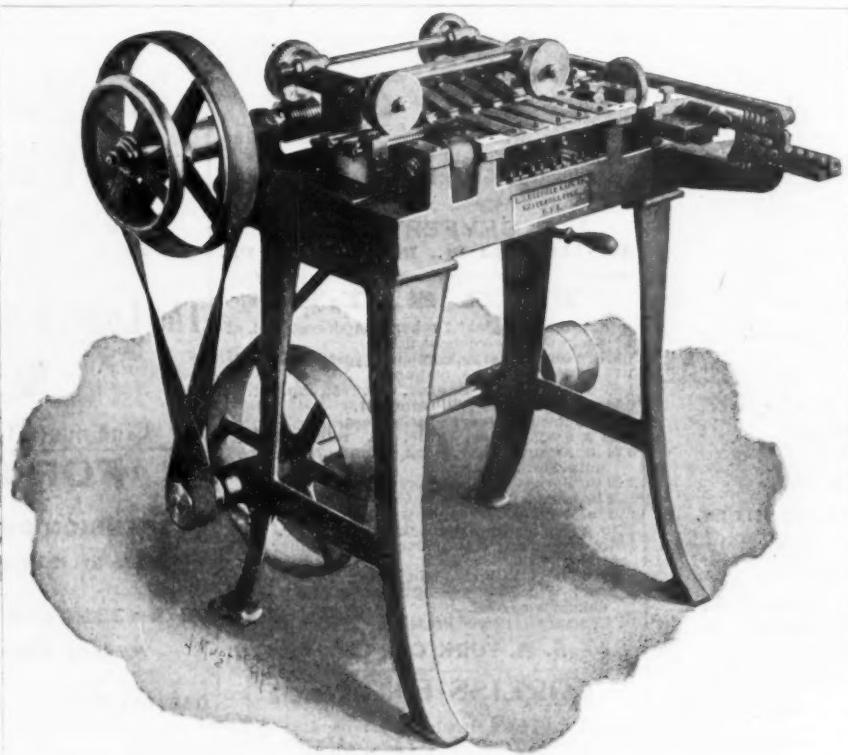


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High speed, and high grade.  
We build both engine & generator.  
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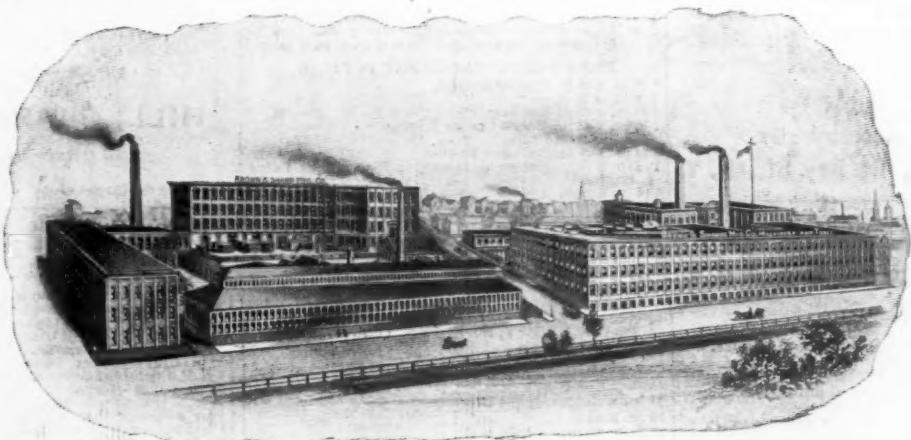
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**MILLING MACHINES:** Universal, Plain, Vertical Spindle; **GRINDING MACHINES:** Universal, Plain, Surface; **AUTOMATIC GEAR CUTTING MACHINES;** **SCREW MACHINES:** Plain, Wire Feed, Automatic; **CUTTERS:** Milling, Gear, Formed; **RULES, SCALES, STANDARD GAUGES** and **MACHINISTS' TOOLS.**

Several of the Machines will be belted ready to show in actual operation.

We shall also have exhibits at Champ de Mars, Palace of Machinery and Electricity, Block 4, Space 1, and Palace of Liberal Arts, Block A, Space 5. At these exhibits will be shown representative lines of our Machinery, Tools, Cutters, Standard Gauges, etc.

The Machines and Tools shown have not been specially selected, nor prepared for exhibition, but are the same in finish and design as those in stock or approaching completion at our works.

Many of the Machines and Tools are new in design and have not been publicly shown until this time.

BROWN & SHARPE MFG. CO.,  
PROVIDENCE, : : : R. I., U. S. A.

Foreign Representatives: ENGLAND: Chas. Churchill & Co., Ltd., London; Buck & Hickman, London.  
FRANCE: Fenwick Frères & Co., Paris  
GERMANY: Gustav Diechman & Sohn, Berlin, C.; Schuchardt & Schütte, Berlin, C.  
RUSSIA: J. Block Co., Moscow.  
DENMARK: V. Löwener, Copenhagen, K.



## SECOND-HAND MACHINERY.

### ENGINE LATHES.

12 in. x 4 ft. Pond, R. & F.  
12 in. x 5 ft. Young, plain  
12 in. x 6 ft. Blasdell, R. & F.  
14 in. x 5 ft. Putnam R. & F., W. G.  
14 in. x 7 ft. 4 in. Putnam R. & F., W. G.  
14 in. x 6 ft. Porter R. & F.  
14 in. x 5 ft. Robbins, R. & F.  
216 in. x 6 ft. Ames, special features.  
218 in. x 6 ft. Fuller, R. & F.  
218 in. x 8 ft. Fuller, R. & F.  
18 in. x 8 ft. Fitchburg comp. rest.  
120 in. x 14 ft. Chamberlain, "old style."  
125 in. x 19 ft. White, taper, "old style."  
127 in. x 10 ft. D. W. Pond, comp. rest.  
128 in. x 12 ft. W. L. & Co., comp. rest.  
127 in. x 12 ft. W. L. & Co., plain back gear turning.  
128 in. x 16 ft. Ditto.  
136 in. x 6 ft. back gear turning.  
140 in. x 16 ft. plain turning.

### SPEED LATHES.

212 in. x 5 ft. B. G. Speed.  
111 in. x 4 ft. "

20 in. B. G. Speed.

122 in. x 9 ft. B. G. Speed.

### PLANERS.

117 in. x 17 in. x 5 ft. Putnam  
224 in. x 24 in. x 4 ft. W. L. & Co.

125 in. x 28 in. x 8 ft. Gay & Silver.

130 in. x 36 in. x 8 ft. White.

136 in. x 36 in. x 8 ft. New Haven.

### PRESSES.

1 No. 3 C. & M. Single.  
1 No. 14 Stiles, heavy special.

1 No. 5 Blake & Johnson arch.

1 No. 82 S. & F. Foot.

### Two 20-Ton Hand Traveling Cranes, 58 ft. 10 in. Span.

Large Stock New Machines. Prices on application.

The Niles Tool Works Co.,  
136-433 Liberty St., New York.

## Special Bargains.

### Second-hand Tools.

1800 lb. Morgan Steam Drop Hammer.  
1800 lb. Merrill Drop Hammer Board lift  
121 in. Gisholt Turret Lathe with taper attachment and power cross feed.  
124 in. Morton Key Seating Machine.  
12-spindle Hilles & Jones Plate Drill.  
150 in. x 30 ft. Fifield Triple Geared Lathe.  
178 in. x 18 ft. Triple Geared Lathe, rod feed only.  
148 in. x 48 in. x 12 ft. Niles Planer, single head.  
1 Axle Lathe.  
148 in. 150-ton Hydrostatic Wheel Press.  
136 in. x 16 ft. Bradford Engine Lathe, new.  
132 in. x 18 ft. Walcott Engine Lathe, new.

Complete stock of both new and second-hand machinery. Write us for what you want.

McDOWELL, STOCKER & CO.,  
59-61 So. Canal St., Chicago.

## FOR SALE.

One piece of two inch diameter Pliable Steel Hoisting Rope, never been used, at a bargain.

The Thomas Laughlin Company,  
PORTLAND, MAINE.

## FOR SALE.

One Gould & Garrison duplex 12 x 18 x 8 x 6 x 9 combined water and vacuum pump.

W. J. CARLIN COMPANY,  
610-611 Lewis Bldg., Pittsburgh, Pa.  
New York Office:  
514-515 Park Row Bldg., New York, N. Y.

## FRESH BARGAINS.

1 Sellers Steam Riveter with power hoist, 42 in. gap-cyl. 36 in. x 3 in. stroke.

1 Sellers Steam Hammer, cyl. 18 in. x 24 in., single standard.

1 Sellers Cut-Off Machine—double head with centering attachment.

1 Bement Bar Shear.

1 48 in. x 20 ft. Triple Geared Lathe.

1 Double Car-Box Blower.

1 48 in. Swing Drill Press.

1 15 Tons Yale & Towne Steel Jib Crane.

1 5 Tons Pillar Crane.

2 5 Tons Wooden Foundry Cranes.

2 3500 lbs. Ladles on wheels.

Large Lot Pulleys, Shafting and Hangers.

1 No. 9 Sturtevant Blower.

Send for Prices.

THOS. P. CONARD,

119 So. Fourth St.,

Philadelphia.

## MISCELLANEOUS.

1 5 H. P. Westinghouse Motor.  
1 8 H. P. Elect. Motor.  
1 No. 2 P. & A. Cylinder Borer.  
1 No. 48 Green River Bolt Cutter.  
1 Double Head Nut Taper.  
1 Morgan Hyd. Riveter.  
1 Heavy Broaching Machine.  
2 Oil Separators.  
2 Brazing Forges.

## IN STOCK FOR IMMEDIATE SHIPMENT.

24 in. x 10, 12, 14 and 16 ft. Lathes.

30 in. x 26 ft. Lathe.

36 in. x 16 ft. "

42 in. Bullard Vertical Mill, 2 hds.

36 x 36 x 10 ft. Cincinnati Planer, 2 heads.

36 x 36 x 14 ft. Cincinnati Planer, 2 heads.

42 x 42 x 19 ft. Pond Planer, 3 heads.

6 ft. Acme Bickford Radial Drill.

800 lb. Morgan Steam Hammer.

Full line Cincinnati Plain and Universal Milling Machines.

Marshall & Husehart Machinery Co.,

62 and 64 So. Canal St., Chicago, Ill.  
19 So. Water St., Cleveland, Ohio.  
510 Johnston Bldg., Cincinnati, Ohio.

## FOR SALE.

### Mill and Contractors' Machinery.

1 35 in. three high Mackintosh & Hemphill Blooming Mill, with table and Hydraulic Manipulators.

1 Mackintosh & Hemphill Billet shear.

2 Hydraulic Cranes.

1 Roll Lathe.

1 10-ton Buffalo Pitts Steam Road Roller in excellent condition.

### Machine Tools For Sale.

1 Suspended Drill Press with countershaft.

1 No. 9 B. Buffalo Blower, N. Y. Delivery.

1 12 in. Fitchburg shaper, sliding head.

1 9 in. Gould Shaper.

### Engines For Sale.

1 30 x 36 in. Vertical Corliss Rolling Mill Engine with 20 ft fly-wheel.

Vertical and Horizontal Engines.

Portable, Horizontal and Vertical Boilers.

Hoisting Engines, Steam Pumps, Centrifugal Pumps, Grinding Pans, Shears and Stone Crushers.

THOMAS CARLIN'S SONS,

386 River Avenue, Allegheny, Pa.

## Presses and Mills

One Arch Power Press with Dial Feed. Good Order.

One three spindle Lathe, 12 in. x 6 in. swing, 8 ft. bed, no countershaft. Good Order.

One Automatic Milling, Drilling and Tapping Machine for finishing battery zincs. Can be adapted for other work of a similar character. In A1 Order.

One No. 2 Plain Drop Press, fitted with 200 lb. hammer and power lifter, countershaft.

One Stand of Rolls, original size 10 in. diameter x 15 in. face, now slightly under size; in good order, including housings, pinions and main driving gear, designed to be driven from pinion on main line underneath the stand.

**MOSSBERG & GRANVILLE MFG. CO., PROVIDENCE, R. I.**

"**A. Good A. Now."**

22 in. & 40 in. x 48 in. Tandem Compound Harris Corliss.

16 in. & 32 in. x 48 in. Tandem Compound Greene, for direct connection.

26 in. x 60 in. Harris Corliss.

22 in. x 42 in. Wright Corliss.

150 H. P. Compound Westinghouse.

### Boilers.

2 250 H. P. Sterling Water Tubes.

2 150 H. P. Sterling Water Tubes.

2 200 H. P. National.

10 72 in. x 16 ft. Return Tubulars.

1 60 in. x 16 ft. Return Tubular.

4 90 ft. x 42 in. Stacks.

6 100 H. P. Vertical Cook Boilers.

1 600 H. P. Nordberg Jet Condenser.

**ROSSITER, MAGGOVERN & CO.,**

141 Broadway, N. Y.

Factory, Brooklyn, N. Y.

## FOR SALE.

2 Vertical Compound Corliss Engines, 20-36 x 36 wheels, 17 ft. x 50 in. face.

200 ft. 7-in. steel shafting, with floor stands and couplings.

6 72-in. x 18 ft. Hor. Tub. Boilers, 120 pounds steam

3-ply leather Belting, 36 in., 42 in. and 48 in.

24-42 x 48 Cross Compound Wright Engine.

24 x 42 Watts Campbell Corliss.

32-60 " " "

14 x 32 " " "

Surface and Jet Condensers, Elevators, Dynamos, Pumps, Hoisting Engines.

**MARVIN BRIGGS,**

12 Broadway, N. Y.

## Notice.

Trustees' sale of Standard Sash and Door Co.; has been purchased by me. Large factory, fully equipped. Great bargain. Send for full list, also large line of engines, boilers and pumps.

J. H. KERRICK,  
Minneapolis, Minn.

### IMMEDIATE DELIVERY.

12 Plain Vertical Engines, 3 to 50 H. P.

Plain Horizontal Engines, 10 to 150 H. P.

Automatic Engines, 15 to 300 H. P.

Direct Connected Engines, 15 to 400 H. P.

High grade and maximum efficiency.

Holting Engines from 6 to 50 H. P., single and double cylinders and drums.

10 20 in. Lever and Wheel Feed Drill Presses.

10 20 H. P. Boiler Feed Pumps.

**PENNSYLVANIA MACHINERY CO.,**

The House, Philadelphia.

**WANTED**

in good second-hand condition.

1 No. 4 Bliss Toggle Press.

1 No. 5 Spinning Lathe, Bliss.

1 No. 105½ Circular Shears, Bliss.

Address, "C,"

care The Iron Age, Fisher Building,

Chicago, Ill.

## MACHINERY FOR SALE.

Consisting of one Variety Moulder, one four-sided eight-inch Moulder, two Mortisers, two Boring machines, one Grooving machine, one Dado, one Sash-boring machine, one Door Clamp, one Four Spindle Grinder.

These are all in good condition, and may be seen at the works of the

**RIKER ELECTRIC VEHICLE CO.,**

Elizabethport, New Jersey.

## FOR SALE.

8-inch and 2-inch Pipe Cutting Machines, Shafting,

Drill Press and 5 horse power Motor.

GEO. P. J. COBS & CO.,

South 9th St. and Broadway, Brooklyn, N. Y.

## New Tools in Stock Or For Quick Delivery.

48 x 20 Fitchburg triple geared lathe.  
 72 x 28 Fifield ditto.  
 44 x 28 Fifield ditto.  
 38 x 28 Fish trip. grd. ditto.  
 36 x 16 Fish lathe, C. R.  
 32 x 18 & 22 Fay, & Scott lathes, C. R.  
 30 x 12, 14 & 16 ft. Davis lathes, C. R.  
 30 x 15 Fish lathe, C. R.  
 30 x 12 & 14 Lodge & Shipley lathes, C. R.  
 26 x 10 & 12 Fifield triple grd. lathes.  
 25 x 12 & 14 Davis lathes.  
 24 x 12 & 14 Lodge & Shipley lathes.  
 24 x 12 Putnam lathe.  
 14, 15, 17 and 20 in. Putnam lathes.  
 Small lathes, all sizes.  
 Upright drills, 20 to 42 in.  
 28 x 33 x 18 Cincinnati planer, 2 hds.  
 30 x 30 x 14 ft. ditto, 2 hds.  
 28 x 28 x 8 Pond planer.  
 30 x 27 x 8 Rochester planer.  
 24 x 24 x 6 L. W. Pond planer.  
 36 in. Superior automatic gear cutter.  
 4, 5 and 6 ft. arm Bickford radial drills.  
 Cincinnati univ. and plain millers.

Also large assorted stock of other tools. Write us your needs.

**PRENTISS TOOL & SUPPLY CO.,**  
 115 Liberty St., New York City.  
 Buffalo Office, 603 D. S. Morgan Bldg.

## FOR SALE.

New 12 in. x 12 in. Armington & Sims Engine (75 horse power), latest type, self oiling, Rites governor, direct connected, or if belted driving pulley to suit. Delivery at once. Price will interest.

Address

**A. B. PITKIN MACHINERY CO.,**  
 Providence, R. I.

## FOR SALE.

500 feet 12 inch Wrought Iron Steam Pipe.  
 400 feet 12 inch Cast Iron Bell Pipe.  
 Several Large Iron Tanks round and square.  
 One Duplex Steam Pump, 6½ in. suction, 5 in. discharge.  
 One Duplex Steam Pump, 4 in. suction, 8 in. discharge.

**J. H. McCLOURE & SON,**  
 202 Walnut Place, Philadelphia.

## FOR SALE.—BARGAINS.

5 Story "Otis" Steam Elevator, complete.....	\$450
50 H. Horizontal Tubular Boiler, guaranteed.....	225
390 H. "Austin" Feed Water Heater.....	150
100 H. Receiving Tank, 150 lbs. test.....	75
10 H. Charter Gas Engine, A1.....	250
10 H. Upright Side Crane Engine, new.....	80
15 H. Submerged Flue Upright Boiler.....	100
No. 1 "Sturtevant" Blower, new.....	15
34 x 14 Engine Lathe.....	220
18 x 7 Engine Lathe "Ames" and Chuck.....	125
Blade Sensitive Drill and Chuck.....	35
24 in. Upright Drill Press.....	40
16 in. Upright Drill Press.....	20
20 in. x 20 in. x 4 ft. Iron Planer, not complete, new.....	100
12 in. Kumb Automatic Upright C. C. Engine.....	50
10 H. Erie City "Upright" Boiler complete.....	80
15 H. Upright Boiler complete with fittings.....	100
20 in. Lathe, Headstock.....	100
"Diamond" Emery Grinder.....	15
100 ft. "Jeffrey" Reinforced Link Belt 75 and 100. 100 ft. x 15 in. Planer, chuck, heavy.	100

**PARADOX MACHINERY CO.,**  
 181 E. Division St., Chicago.

## "SPECIAL."

3 Mossberg & Granville Power Presses No. 8 B.  
 1 Springfield Power Press No. 3.  
 1 Bissack Geared Power Press No. 4 E.  
 1 Stiles Imp. Power Shear No. 241.

The above machines have not been run over one week and are practically new.

**THE THOMAS & LOWE MACHINERY CO.,**  
 Providence, R. I.

## FEED WATER HEATERS.

Good Second-hand Stock; DeVries, Berryman and others. All tested and guaranteed. Prices lowest  
**F. L. PATTERSON,**  
 136 Liberty St., New York

## SPECIAL BARGAINS

### SECOND-HAND TOOLS.

#### LATHES.

1 11 x 5 Prentiss Bros.	1 9 in. crank Bement.
1 11 x 6 Prentiss Bros.	1 30 in. Friction, Juengst
1 13 x 4 Speed.	
1 13 x 6 Ames.	
1 16 x 6 Pratt & Whitney.	1 No. 3 P. & W. full auto.
1 16 x 6 Brown.	1 No. 3 P. & W. wire feed.
1 16 x 6 Ames, taper.	1 No. 5 P. & W. tric. head,
1 16 x 6 Harrington.	2 in. hole.
1 16 x 8 Somerset Bros.	1 14 in. Ames Wire Feed.
1 17 x 6 Wm. Gleason.	1 20 x 6 Bapt. Plain.
1 18 x 6 New Haven.	
1 18 x 6 Fuller.	
1 18 x 8 McMahon.	
1 18 x 6 Pratt & W., Plain.	1 No. 2 H. & J. Vertical.
1 18 x 7 Pratt & W., Plain.	1 No. 3 Newton Plain.
1 18 x 8 Pratt & W., taper.	1 No. 4 Garvin plain.
1 18 x 10 Am. T. & Mch. Co.	
1 20 x 7 Pratt & W., Plain.	
1 20 x 8 Stover.	
1 20 x 10 Bapt. & Chucking.	
1 30 x 12 Bapt. & Chucking.	
1 32 x 11 ft. 6 in. Pond.	
1 32 x 14 Pond.	
1 34 x 19 Freehand.	
1 Bement Single Axle Lathe	1 Set of Adams & Price
1 Niles Double Axle Lathe	Snuff Mills.
with Crane.	

#### PLANERS.

1 38 x 36 x 16 ft. Wood, Light & Co.	1 12 in. P. & W. Facing Machine.
1 60 x 60 x 20 ft. Fitchburg.	1 Wood, Light & Co. 28 Spin-dle Profiler.
1 70 x 50 x 24 ft. 6 in. N. Y. Steam Eng. Co.	1 Bement Hy. Rail Bender.
	1 Syracuse Boiler Punch, 30 in. Throat.
	1 12 in. W. & S. Monitor.
	1 12 in. Slotted, Freeland.
	2 N. Y. Tube Welders.
	1 Set of Adams & Price Snuff Mills.
	1 Sellers 14 ft. Plate Planer
	1 P. & W. Die Sinker.
	1 P. & W. Nut Tapping Machine.
	1 Wood, Light & Co. 28 Spin-dle Profiler.
	1 Bement Hy. Rail Bender.
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	1 P. & W. Die Sinker.
	1 P. & W. Nut Tapping Machine.
	1 Wood, Light & Co. 28 Spin-dle Profiler.
	1 Bement Hy. Rail Bender.
	1 Syracuse Boiler Punch, 30 in. Throat.
	1 12 in. W. & S. Monitor.
	1 12 in. Slotted, Freeland.
	2 N. Y. Tube Welders.
	1 Set of Adams & Price Snuff Mills.
	1 Sellers 14 ft. Plate Planer
	1 P. & W. Die Sinker.
	1 P. & W. Nut Tapping Machine.
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	2 N. Y. Tube Welders.
	1 Set of Adams & Price Snuff Mills.
	1 Sellers 14 ft. Plate Planer
	1 P. & W. Die Sinker.
	1 P. & W. Nut T

## BLAST FURNACES FOR SALE.

We have for sale two Coke Furnaces, now in blast, each making over 175 tons per day. Also one Charcoal Furnace making 40 tons of Warm Blast Iron per day.

The output for the year of all these furnaces could be sold now at prices that will cover the asking price of each plant.

For particulars address

J. H. HILLMAN & SON,  
No. 8 Wood St., Pittsburgh, Pa.

Tel. 1238 Pgh.

## 2d-HAND FEED WATER HEATERS.

Largest stock in America. Will be sold at bargains. These heaters are mostly taken in exchange for our improved Berryman (Kelley's Patent), "A Little Giant," vastly superior to all other feed water heaters, both as to results and durability.

BENJ. F. KELLEY & SON, 91 Liberty St., N. Y.

## FOR SALE.

1 10 in. 3 high bar mill.  
1 18 in. 3 high bar mill.  
2 Lewis foundry power shears, 3 in. stroke.

W. J. CARLIN COMPANY,  
610-611 Lewis Bldg., Pittsburgh, Pa.  
New York Office:  
514-515 Park Row Bldg., New York, N. Y.

## 2d-Hand Machinery Bargains.

Corliss, High Speed Automatic, Simple, Compound, Condensing and Slide Valve Engines; also Blowing Engines, Boilers, Heaters, Pumps, Vacuum Pans, Ice Machines, Electric Motors, Generators, Railway Supplies, Metal Working and General Machinery.

CHAS. BEHLEN,  
72 Trinity Place, N. Y.

## MACHINE TOOLS.

16 in. x 6 ft. Lathe.  
18 in. x 6 ft. Lathe.  
48 in. Post Drill.  
Single Punch capacity  $\frac{1}{2}$  in. hole in  $\frac{1}{2}$  in. iron.  
60 lb. Steam Hammer.  
40 lb. Justice Hammer.  
50 lb. and 200 lb. Drop Hammers.  
Giant Key Seaters.  
Complete stock of new Machine Tools.

W. R. COLDIRON MACHINERY CO.,  
428-429 North 2d St., St. Louis, Mo.

## FOR SALE. ROLLING MILL MACHINERY, AT NORWICH, CONN.

Consisting of one 10 in. 3 high train one 18 in. 2 high mill, with 36 x 36 vertical engine with 70 ft. fly wheel, one Garrison squeezer, one roll lathe, one 36 in. drill press.

W. J. CARLIN COMPANY,  
610-611 Lewis Bldg., Pittsburgh, Pa.  
New York Office:  
514-515 Park Row Bldg., New York, N. Y.

## FOR SALE OR RENT.

Large Foundry Plant fully equipped. Has exceptional shipping facilities over two belt and one trunk line railroads. Located just outside Chicago. For particulars address

"FOUNDRY PLANT,"  
Care The Iron Age, 805 Fisher Bldg., Chicago.

## Second-Hand. IN FIRST-CLASS CONDITION.

One each 60 and 80 lb. Bradley Herve Hammer.  
One each 50 and 250 lb. Drop Hammers.  
Two No. 6 Root Blowers.  
One No. 72 Ferracute D'ble Crank Press.  
One 2 in. Cleveland Auto. Screw Machine.  
One 18 in. (opening) Allington Exhaust Fan.  
Large stock new and second-hand machinery.

DAWSON & GOODWIN,  
41 S. Canal St., Chicago.

## Immediate Delivery.

### ENGINES.

2 18½ x 18 McInosh & Seymour Automatic.  
1 New 18 x 16 Amer. Automatic.  
1 12 x 20 x 14 Ideal Tandem Compound.  
1 13 x 12 Ideal 80 to 120 H. P. Automatic.  
1 10 x 12 Hall 50 to 70 H. P. Automatic.  
1 14½ x 15 Armington & Simms Automatic.

### BOILERS.

2 66 x 18.  
3 72 x 16 and others, write.

### PUMPS.

1 H. R. Worthington Duplex 14 x 19 x 15.  
1 " " " Pressure 14 x 7 x 10.

1 Morris Machine Wks. Centrifugal and discharge.

### HEATERS.

50 to 500 H. P.

### BLOWERS.

30 and 36 inch.

### DYNAMOS.

1 150 K.W. G. E. M. P., 550 R. P. M., 125 Volts.

2 150 K.W. Edison Bipolars, 500 Volts.

2 100 " " 140

1 80 K.W. 125 Volts Siemens & Halske.

2 60 K.W. Edison Bipolars, 125 Volts.

1 50 " " "

1 25 K.W. Westinghouse M. P., 125 Volts.

1 60 K.W. " two phase, 1000 Volts.

1 37½ K.W. " single phase, 1000 Volts.

3 120 K.W. " 1100 "

Are Dynamos, 12 to 150 light capacity.

Motors, direct and alternating current.

Gas Engines, 4 to 25 H. P.

Stock constantly changing; if you do not see what you want write. Ask for Price List No. 40.

ILLINOIS MAINTENANCE COMPANY, Inc.,  
204 Dearborn St., Chicago, Illinois.

## BLOOMING MILL FOR SALE.

One 32 in. Reversing Blooming Mill with pair of 28 in. x 48 in. horizontal reversing engines; also live tables, table engines, hydraulic manipulator etc., built by Mackintosh & Hemphill, Pittsburgh.

W. J. CARLIN COMPANY.

NEW YORK OFFICE : 610 and 611 Lewis Bldg.,  
Pittsburg, Pa.  
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## Large Engine and Machine Works

costing over \$500,000 and containing a complete outfit of

### HEAVY MACHINE TOOLS, FOUNDRY, BOILER SHOP, PATTERN SHOP.

Plant is complete, in good order and all ready to run and will be sold at a slight fraction of its cost to close up an estate. Address

READE & BOWLER,  
CLEVELAND, O.

## FOR SALE.

Two 35 H. P. Fisher C. C. high speed, self-oiling engines with two 400 incandescent light Triumph dynamos, with switch board, lamps and wiring.

W. J. CARLIN COMPANY,

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Drop Forge Works, building 40 x 180 ft., all fitted up with modern tools. 3 Drops. 3 Power Presses. Machine Shop. Japanning Plant. Shears. Brick Boiler House. 2 Steel 40 horse-power Boilers. 1 50 horse-power Engine. Complete Oil-Fuel Plant. Side track in yard, no shifting charges. For information address

F. A. FISHER, Gloucester, Mass.

## FOR SALE. IMMEDIATE DELIVERY.

One steel building 100 x 162, 16 ft. high to the square.

W. J. CARLIN COMPANY,

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NEW YORK OFFICE : Pittsburg, Pa.  
514-515 Park Row Bldg., New York, N. Y.

## FOR SALE.

5,000 tons rich rolling mill cinder.  
5,000 " pulverized iron ore for  
"fix" purposes or blast furnace  
use.

SCHULTZ & CO.,  
Rothschild Bldg.,  
14 So. Broad St., Philadelphia

## Machinery Bargains.

11 x 22 Buckeye Engine.

11 x 11 Vertical Engine.

14 x 14 Marine Engine.

18 x 24 Atlas Automatic Engine.

One 24 x 24 ft. Shafting Lathe.

One 54 x 15 Erie Single Course Boiler, full front.

8½ x 12 Lidgewood Hoist.

One 6 x 4 x 6 Duplex Pump.

Two 70 H. P. Otis Steel Fire Box Boilers.

One 200 H. P. Berryman Heater.

One 1000 H. P. Rowe Feed Water Heater.

28 ft. 5 ½-16 Shafting with 5 pillow block bearings.

Two Friction Clutch Pulleys, 72 x 16 in. face.

90 H. P. Waste Heat, Vertical Boiler.

The above are all in first-class condition and ready for shipment.

A. L. DAWSON & CO.

27-31 W. Washington St. Chicago, Ill.

## New and Second-Hand Machinery

### FOR IMMEDIATE DELIVERY.

Engine Lather, 10 in. to 32 in. swing.

Speed Lathes, 10 in. to 20 in. swing.

Shapers, 10 in. to 26 in. stroke.

Planers 20 in. to 34 in.

Drill Presses 10 in. to 28 in.

Milling Machines, Hand and Power.

Screw Machines and Monitor Lathes up to 20 in.

Feed and Power Presses, a variety of sizes.

Drop Hammers with and without automatic lifts.

Hurlburt & Rogers Cutting-off Machines.

Send for our latest list, also catalogue of our new line of Presses, which we are just placing upon the market.

The Danielson Machine & Tool Co.,  
CLEVELAND, O.

## FOUNDRY EQUIPMENTS,

Second-hand, bought for cash; best price given for Cupolas, Blowers, Core Ovens, Cranes, Ladies, Tumbling Barrels, etc., etc. Give complete description.

THE J. D. SMITH FOUNDRY SUPPLY  
COMPANY,  
CINCINNATI, O.

## Corliss Engines For Sale.

3 34 x 60 Horizontal Engines, one right and one left hand, with fly wheels or band wheels to suit.

W. J. CARLIN COMPANY, 610 and 611 Lewis Bldg.,  
New York Office : Pittsburg, Pa.  
514-515 Park Row Bldg., New York, N. Y.

## SPECIAL BARGAINS

In Both New and Second  
Hand Machine Tools.

Special Tools and Machinery De-  
signed and Built to Order.

Write us your wants.

THE J. E. COSTILO MACHINE WORKS,  
Hudson Ave. and Concord Street,  
BROOKLYN, N. Y.

## FOR SALE OR HIRE.

Locomotives For Immediate Delivery.

Two 18 x 24 Standard Gauge Switching Loco-  
motives.

W. J. CARLIN COMPANY,

610 and 611 Lewis Building, Pittsburg, Pa.

New York Office: 514 and 515 Park Row Bldg., New

York, N. Y.

## WANTED.

Radial Drill capable of drilling to the centre of a circle 9 ft. in diameter, new or second-hand.

ACME ROAD MACHINERY CO.,  
Frankfort, Ky.

## For Quick Delivery.

Single Punch, 48 in. throat, 1½ in. in ½ in.  
" " 42 in. " 1½ in. in 1½ in., motor  
driven.  
Single Punch, 11 in. " 1¼ in. in 1 in.  
Double Punch and Shear, 16 in., 1 in. in ¾ in.  
Bevel Shear, 11 in. throat, for ¾ in. plate.  
Splitting Shears, for ¾ in. plate.  
" " for ½ in. plate.  
" " for ½ in. plate.  
Guillotine Frame Bar Shear, 17 in. knife.  
Double Angle Shear, 6 x 6 x 1 in., on turntable.  
" " 4 x 4 x ½ in.  
Multiple Punch or Gate Shear, 78 in.  
Punching and Riveting Press, 5 ft. gap.  
Plate Planer, 6 feet cut.  
Plate Planer, 20 ft. cut.  
Plate Bending Rolls, 1½ in. x 100 in. plate.  
" " 12 ft. 2 in. between housings.  
Hand Spacing Table, 8 ft.  
Radial Drills, 48 in. and 60 in. arm.  
Flanging Clamps, for 10 ft. plates.  
6½ ft. Gap Steam Riveter (in good condition).  
4 ft. 8 in. Gap Steam Riveter (in fair condition).  
One pair 9 x 9 Duplex Engines, vertical.  
HILLIS & JONES COMPANY,  
Wilmington, Delaware.

## Immediate Delivery.

### HOISTING ENGINES,

All Double Cylinder.

7½ x 10 in. Lambert Four Spool, Double Drum, with boiler, new.  
6½ x 10 in. Lambert Double Drum, with boiler, new.  
7½ x 10 in. Lambert Double Drum, new.  
Four 8½ x 10 in. Lambert Four Drum.  
7½ x 12 in. Munday Four Drum, with boiler.  
6 x 8 in. Carlin Double Drum, new.  
6½ x 8 in. Elevator Engine, 2000 lbs. capacity.  
Three Double Cylinder, Single Drum Link Motion Engines, with or without boilers.

### ENGINES.

14 x 42 in. Cooper Corliss, left hand.  
14 x 14 in. Vertical Center Crank, new.  
Two 12 x 16 in. Horizontal Center Crank.  
12 x 12 in. Vertical Center Crank, new.  
10 x 15 in. Horizontal Center Crank, new.  
10 x 10 in. Vertical Center Crank, new.  
Fifteen New and Second-hand Smaller Engines.

### Coupled Reversing Engines.

6½ x 8 in. Vertical.  
5 x 5 in. Vertical, new.

### BOILERS.

150 H. P. Vertical Tubular.  
125 H. P. Vertical Tubular.  
50 H. P. Horizontal Tubular, new.  
250 H. P. Horizontal two-flue.  
40 H. P. Firebox Portable, new.  
40 H. P. Horizontal two-flue.  
30 H. P. Firebox Portable, new.  
20 H. P. Firebox Portable, new.  
40 H. P. Vertical Submerged Tubular Boiler.  
Eleven other new and second-hand Boilers.

CARLIN MACHINERY & SUPPLY CO.,  
John H. Carlin, Prop.,  
186 to 192 Lacock St., Allegheny, Pa.  
L. D. Phone 233.

## ENGINES and BOILERS.

150 H. P. Porter Allen Automatic Engine.  
180 H. P. Beck Automatic Engine.  
111 x 14 Buckeye Automatic Engine.  
115 x 28 Buckeye Automatic Engine.  
123 x 48 Harris Corliss Engine complete.  
8 60 x 16 Horizontal Tubular Boilers.  
8 72 x 18 Horizontal Tubular Boilers.

Send for complete stock lists and prices.

W. D. NORTON, 6th and Carr Sts., Cincinnati, O.

## Machinery and Engine Bargains.

17 in. x 8 ft. Johnson Lathe.  
18 in. x 16 ft. New Haven Lathe.  
20 in. x 20 ft. Blaisdell Lathe.  
40 in. x 21 ft. N. Y. S. E. Co. Triple Geared Lathe.  
24 in. x 24 in. x 6 ft. Fitchburg Planer.  
24 in. x 24 in. x 7 ft. Pond Planer.  
36 in. x 36 in. x 6 ft. New Haven Planer.  
21 in. Davis & Egan Geared Shaper.  
48 in. Niles Radial Drill.  
27 in. Throat Punch for 1 in. hole in 1 in. iron.  
1 Pair 24 x 48 Wm. Wright Engines on one shaft.  
1 18 x 32 Single Cylinder Double Drum Haulage Engine.  
Hoisting Engines for all purposes.  
Complete line new metal working machinery.  
For sale by

WM. C. JOHNSON & SONS MACH'Y CO.,  
St. Louis Mo.

## Second-hand Tools

### WE HAVE OPENED A Large Warehouse WITH A Repair Shop

Comprising 11,000 square ft. where we have a large stock of **Second-hand Tools** which we completely Overhaul.

This is in addition to our main business, which is

## New Tools.

Write For Our List.

## U. Baird Machinery Co.

323-325 Water St., 392-394 First Ave.,  
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## Bargain-Shafting Hangers.

No. 1, Makers, Dodge Mfg. Co., adjustable ball and socket double brace hangers, with chain oiling bearings.  
88-90 in. drop 2 15-16 in. shaft, List, \$25.50.  
18-20 in. drop 2 15-16 in. shaft, List, \$21.20.  
10-18 in. drop 2 15-16 in. shaft, List, \$20.15.  
Discount 70, 10 and 5 per cent.

MACHINISTS' SUPPLY CO.,  
Rochester, N. Y.

### FOR SALE.

1 No. 2 Cincinnati Milling Machine, new.  
1 No. 2 Garvin Screw Machine, wire feed, second-hand.  
2 No. 2½ Garvin Screw Machines, plain, second-hand.  
1 Double Head Garvin Screw Machine.  
13-in. Stroke Michels Shaper.  
30 x 90 x 9 Gleason Planer.  
12-in. Lathe with turret fitted.  
13-in. Swing Woodward & Rogers Drill Press.  
1 Same Style as above but not W. & R. make.  
1 36 in. Heavy Bk. Gd. Drill Press, Massonet Mch. Co.  
1 Gravas Hydraulic Elevator complete.  
1 24 x 24 x 6 Grey Planer, No. 36.  
MACHINISTS' SUPPLY CO., Rochester, N. Y.

### DUPLEX AIR COMPRESSOR.

Ingersoll-Sergeant Piston Inlet Air Cylinders, 18 x 30 in. Corliss valve Steam Cylinders.

### LOCOMOTIVE.

7 x 12 in. 3 ft. Porter Saddle Tank Engine.  
Two 3 ft. side dump cars, 2½ yard, new.

### MISCELLANEOUS.

Eleven new and second hand Steam and Centrifugal Pumps.  
Fourteen Steel Hoisting Tubs for Steel Foundries, Furnaces or Contractor.  
About 60,000 feet of Hoisting and Galvanized Wire Rope.

### MACHINERY.

48 in. Niles Car Wheel Boring and Facing Mill.  
24 in. x 12 ft. Engine Lathe.  
16 in. x 8 ft. Engine Lathe.  
Boiler Makers' Bevelling shears.  
Wood Boring Machine, Shaper, Jig Saw.  
Derricks and Derrick Fittings.

CARLIN MACHINERY & SUPPLY CO.,  
John H. Carlin, Prop.,  
L. D. Phone 233. 186 to 192 Lacock St. Allegheny, Pa.

## Capital Wanted.

A young man, a thorough mechanic and capable manager, has \$15,000, wishes to find a party with an equal amount to join with him in the purchase of an established machinery business. For further particulars address

"MACHINERY,"

Care Secretary Board of Trade  
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## MACHINE AND BLACKSMITH SHOP

At Peoria, Ill., for sale. Best equipped outside of Chicago. Machine shop 100 x 50, with lathes, planers, drills and tools of all kinds for heavy and light work. Blacksmith shop 50 x 45, with fine Bement steam hammer, iron crane and full assortment of small tools. Population of Peoria 65,000. Only one other shop here. Labor troubles unknown. Opportunity of lifetime. Will be sold cheap on account of owner's poor health. Address

J. C. FLANIGAN,  
1615 S. Adams St., Peoria, Ill.

## FOR SALE.

One Pond Planer, 36 x 36 x 17 ft.

One New Haven Lathe, 25 in. swing, 16 ft. bed.

One Vertical Engine 14 x 14, roughry valve, self contain.

One Sturtevant Steel Blower, 68 in. high, 26 inlet, 22 outlet.

Also one Atlas 10 x 12.

One Dienelt & Eisenhardt 250 lb. dead stroke Hammer.

Also a large lot of iron tanks.

WM. ECKBOLDS' SONS,

711 E. Girard Ave., Philadelphia.

## FOR SALE.

One Corliss Engine, 26 in. x 60 in., fly wheel 20 ft. diameter, section of rim 15½ in. x 11 in. One Multiple Drill Press, four spindles, 8 ft. between housings, built by Messrs. Bement, Miles & Co. for drilling holes in plates.

Five trains of plate rolls. One 9 ft Flywheel, new, 7 in. bore, weight 6000 lbs. Two Bliss Guillotine Upright Shears, 72 in. gap, 8 in. stroke. One Dean Duplex Pump, 6 x 5½ x 6. One Rod Straightening Machine, built by the Medart Patent Pulley Co. for straightening rods up to 3 in. diameter and 25 ft. long. A lot of extra cold and hot plate rolls (new) and numerous other items from the Olney Copper Plant.

HENRY A. HITNER'S SONS,  
Gaul and Sergeant Sts., Philadelphia.

## SECOND HAND IRON PULLEYS.

We have on hand a large quantity of all size Iron Pulleys in good condition. In this lot are some extra large sizes. Our price on them is very low. Ask for our list.

Also on hand

## BRAND NEW WOOD SPLIT PULLEYS,

that we bought at receiver's sale. Be sure to get our prices. We can save you money on

## BELTING, SHAFTING, HANGERS

and supplies of all kinds. We are headquarters for

## SECOND HAND MACHINERY.

Write at once for Catalogue No. 78.  
Address

## Chicago House Wrecking Co.,

WEST 35th and IRON STREETS,

CHICAGO.

30 in. x 30 in. x 8 ft. Whitcomb Planer.  
36 in. x 36 in. x 12 ft. "

### FOR SALE.

The first of modern design and practically as good as new. The other new, and of first-class workmanship. The above will be sold for cash, at a low price, under a guarantee as represented. Terms cash with order. Full particulars given on application to.

S. T. LUND, 77 Oliver St., Boston, Mass.  
Machinery Plants bought, sold, and appraised.

### FOR SALE.

One Straightening Roll, 48 in. wide, with 5 in. Rollers.

One Bending Roll x 65 in. wide, with 6 and 8 in. Rollers.

One Bending Roll, 100 in. wide, with 7 and 9 in. Rollers.

One Bending Roll, 148 in. wide, with 15 in. Rollers.

THE WAIS & ROOS PUNCH & SHEAR CO.,  
Cincinnati, O.

### FOR SALE.

A 100,000 pound testing machine made by Flutus Olsen & Co., practically new, never been used.

FRANKLIN STEEL CASTING CO.,  
Franklin, Pa.

## FOR SALE. SPECIAL ENGINES.

1 14 in. x 20 in. (Vertical) Slide Valve.  
 \*1 14 in. x 30 in. Keystone Corliss (Brand new).  
 \*1 16 in. x 30 in. "Rice" Automatic Heavy Duty Type, 150 revs. per M.  
 \*1 11 in. and 19 in. x 24 in. Tandem Comp'd "Buck-eye" (latest type) with condenser.  
 \*1 20 in. x 48 in. Woodruff & Beach Automatic.  
 \*1 22 in. x 42 in. Wetherill Corliss  
 \*1 22 in. x 42 in. do  
 \*1 23 in. x 48 in. Geo. H. Corliss make.  
 1 24 in. x 36 in. Mackintosh, Hemphill & Co., Bal. Slide Valve.  
 1 28 in. x 60 in. Piston Valve Type.

### BOILERS.

3 Horizontal Tubular, 72 in. x 16 ft., with 84 3/4 in. tubes, approved for 100 lb. pressure, complete.

### SHAFTS and PILLOW BLOCKS.

15 Very fine Forged Shafts, finished all over, 10 in. diam. to 16 in.

### FLY WHEELS.

For use as balance wheels and as belt wheels.

### SMOKE STACK.

Very fine steel self-supporting stack 64 in. diam., 100 ft. high, with base casting, ornamental top and ladder.

### HAMMERS.

1 Hackney Cushion Hammer.  
 1 1200 lb. Double Frame Steam Hammer.  
 1 4 ton do

### BELTING.

1 Fine double leather belt serviceably equal to new. 35 in. wide and about 130 ft. long.

### SHEARS.

1 Massive Alligator Shear for cutting old rails, billets and scrap iron, with engine built on. Built by Lewis Foundry, Pittsburgh.

\*Signifies Right-hand.  
 +Signifies Left-hand.

**B. M. EVERSON,**  
 German Nat. Bank Bldg. (6th and Wood),  
 PITTSBURG, PA.  
 Sales Agent for  
 Baldwin Locomotive Works, Phila.

## For Sale.

One 25-ton 50 ft. span, MORGAN Square Shaft Crane, in good condition and ready for immediate delivery.

THOMAS CARLINS' SONS CO.,  
 386 River Avenue, Allegheny, Pa.

## FOR SALE.

### IMMEDIATE DELIVERY.

1 Second-Hand 20 in. Eberhardt Water Tool Grinder.  
 1 No. 6 Sterling Emery Machine.  
 3 No. 4 " " "  
 1 D. " " "  
 3 12 in. Floor Water Tool Grinders.  
 6 Little Giant Tool Grinders.  
 12 Bench Machines for 6 in. Emery Wheels.  
 18 " " 10 "  
 20 " " 12 "  
 6 " " 14 "  
 2 " " 16 "  
 24 in. Union Stone Knife Grinder.  
 1 36 in. " "  
 4 Sterling Emery Machines, A.  
 2 Wells Bros. Cutter Grinders.  
 4 Double Column Polishing Machines.  
 20 Polishing Lathes on Columns.

Established 1882.  
**L. BEST,**  
 45 Vesey Street, New York.  
 Cable Address, Abrasive. Telephone, 1060 Cortlandt.

## FOR SALE.

*The following tools lately in use  
 in a Boiler Manufacturing  
 Plant.*

1 50 ton 36 in. Gap Hydraulic Riveter.  
 1 set 20 ft. Niles Rolls.  
 1 100 ton Olsen Testing Machine.  
 1 18 in. x 22 in. x 18 in. Westinghouse Engine.  
 1 25 H.-P. Standard Westinghouse Engine.  
 1 18 in. x 5 1/2 in. x 18 in. Barr Pump for 500 lbs. pressure.

For additional information address  
**ESTATE OF WM G. WARDEEN,**  
 1012 Witherspoon Building,  
 Philadelphia, Pa.

**WANTED.**  
 900 H. P. Vertical Engine; 8 and 12 x 12 tandem or cross compound engine; 75 to 200 H. P. Corliss engine; steam shovels; half yd. steam digger; 3 ft. saddle tank locomotives and contractors' equipment.

**F. R. SAL.** — Pair 14 x 30 Harris-Corliss; 24 x 56 Watts-Campbell; 13 x 12 and 2 11 x 12 New York Safety. 100 K. W. M. P. 3800, 500, 300, 150, 50 light dynamos. 220 H. P. crane motors, speed 500. 15 H. P., 220 volt motor, slow speed. 4 sturtevant exhaustors, 8 Buffalo blowers. Steam shovels, hoisting engines, crushers, coal mining machinery and contractors' equipment. **SEND DESCRIPTION** any machinery wanted or for sale.

CHELSEY MACHINERY CO., Havemeyer Bldg., N. Y.

## WANTED.

A second-hand Foundry Cupola of about 54 in. shell and 74 in. outside of air box.  
 A second-hand blower for a cupola of the above size.

A second-hand jib crane for foundry use, with 18 ft. or 19 ft. jib.  
 Address with lowest cash price to

P. O. BOX 125,  
 Newport, Pa.

## FOR SALE.

One 150 H. P. Cross-compound Armstrong & Sims Auto. Engine. Cylinders 11 1/2 in. and 18 1/2 in. by 15 in. stroke.  
 1 150 H. P. New York Safety Engine.  
 One 15 in. x 16 in. N. Y. Safety Automatic Engine.  
 One 8 in. x 14 in. Bullock straight Line Auto. Engine.  
 One 7 1/2 in. x 5 in. x 6 in. Duplex Worthington Pump.  
 One 19 in. x 14 ft. Pratt & Whitney Engine Lathe.  
 One 20 in. x 10 ft. Filfield Engine Lathe.

THE E. H. WACHS CO.,  
 158 Indiana St., Chicago.

## FOR SALE.

A hardware business, established 16 years in a thriving interior city in Florida of 5,000 inhabitants. Stock will inventory \$20,000. Sales \$80,000 a year and can be increased. The principal hardware store in the town, with the most prominent location and a reasonable rent. Correspondence solicited **only** from party able to deal on cash basis. Address "H. M." Lock Box 475, Jacksonville, Florida.

## WANTED, TO BUY FOR CASH.

Second-hand Corliss, Brown or Greene Engines, also Machinists' Tools. Send price and particulars to

"F."  
 Box 1368, Boston.

## FOR SALE.

2 400 H. P. Boiler Batteries, each three Corliss Upright Boilers, with Super Heater.  
 2 Worthington 14 in. x 24 1/2 in. x 34 in. Compound Pumping Engines, suitable for 2000 lbs. pressure.  
 1 3000 lb. Morse & Williams Bell Hoist.  
 1 25 H. P. 7 1/2 in. x 7 in. Standard Automatic Westinghouse Engine.  
 1 No. 2 Kelley Belt Boiler Feed Pump.

All in First-Class Condition.  
 THE UNITED STATES PROJECTILE CO.,  
 1st Ave. and 53d St., Brooklyn, N. Y.

## FOR SALE. SECOND HAND MACHINERY

IN FIRST CLASS CONDITION.

1 60 H. P. Slide Valve Engine.  
 1 No. 7 Sturtevant Blower.  
 1 Wheel Tenoning and Cut-off Machine, made by Defiance Machine Works.  
 1 Bolt Header.

JOHNSON & NOYES,  
 1522 Monadnock Block, Chicago.

## WANTED.

First-class modern machine shop wishes to manufacture some specialty (machine tools preferred). Will buy patent or pay royalty. Address,

"R. A."

care The Iron Age, 805 Fisher Building, Chicago.

## FOUNDRY FOR SALE

At a great bargain. Established business. New building. Splendid location. Address

J. A. HAMILTON & CO.,  
 Algona, Ia.

## A RARE OPPORTUNITY.

An opportunity seldom offered. For sale, a clean stock of Hardware in a Railroad centre, in a growing Western city of 20,000 people. Fine agricultural country surrounding. The State Agricultural Board are making plans now for permanent State Fair buildings. Two new railroads now building. The owner, after 34 years of successful business, wishes to retire. Will be sold cheap. No trade. Will invoice \$0,000 to \$12,000. Address, "S. H. D." 45, care The Iron Age, N. Y.

## To Manufacturers

### Seeking New Location :

Exceptional opportunity for progressive manufacturer employing male help. Mill owner in thriving Pennsylvania city offers splendidly lighted well heated, automatically sprinkled loft in modern factory building, floor space 50 x 160, elevators, spur track from R. R. and abundant steam power. Owner will make special concessions in rental and would invest some capital in any legitimate, growing business that stands full investigation. Address

**BULLOCK, 150 Nassau St., New York.**

## FOUNDRY FOR SALE.

A foundry favorably located on B. & O. R. R. at Baltimore, well equipped and in best of condition.

Capacity of furnaces 18 tons per hour.

For full particulars address,

"R. R. B.",  
 care The Iron Age, New York.

## FOUNDRYMAN.

An experienced foundryman, with some capital, can make a profitable arrangement with owners of a well equipped foundry located on B. & O. R. R. Business is well established and plenty of profitable work can be secured if the right man is in charge. Address "OWNERS, 329,"

care The Iron Age, New York.

## For Sale Cheap.

Steam Pump (Blake), Compound Duplex, 12, 18 1/2, 10 1/2 x 12. In use six months.

M. P. COLEMAN,  
 78 Haverhill St., Boston.

### PROPOSALS FOR INDIAN SUPPLIES.

Department of the Interior, Office of Indian Affairs, Washington, D. C., March 20, 1900. Sealed proposals, indorsed "Proposals for beef, flour, etc., as the case may be, and directed to the Commissioner of Indian Affairs, 235 Johnson street, Chicago, Ill., will be received until 1 o'clock, p. m., of Tuesday, April 17, 1900, for furnishing for the Indian Service, beef, flour, bacon, beans, coffee, sugar, rice, tea, and other articles of subsistence; also for boots and shoes, groceries, soap, baking powder, crockery, agricultural implements, paints, oils, glass, tinware, wagons, harness, leather, shoe findings, saddlery, etc., hardware, school and medical supplies, and a long list of miscellaneous articles. Sealed proposals indorsed, "Proposals for blankets, woolen and cotton goods, clothing, etc., as the case may be, and directed to the Commissioner of Indian Affairs, Nos 77 and 79 Wooster street, New York City, will be received until 1 o'clock, p. m., of Tuesday, May 15, 1900, for furnishing for the Indian Service, blankets, woolen and cotton goods, clothing, notions, hats and caps. Bids must be made out on Government blanks. Schedules giving all necessary information for bidders will be furnished on application to the Indian Office, Washington, D. C.; Nos 77 and 79 Wooster street, New York City; or 235 Johnson street, Chicago, Ill.; the Commissioners of Subsistence, U. S. A., at Cheyenne, Leavenworth, Omaha, St. Louis, St. Paul, and San Francisco; the postmasters at Sioux City, Yankton, Arkansas City, Caldwell, Topeka, Wichita, and Tucson. Bids will be opened at the hour and days above stated, and bidders are invited to be present at the opening. The Department reserves the right to determine the point of delivery and to reject any and all bids, or any part of any bid. W. A. JONES, Commissioner.

## FOR SALE.

One Duplex Steam Driven Air Compressor, capacity 300 feet free air per minute; steam cylinders 10 in.; air cylinders 12 in.; stroke 14 in.; Wilson-Snyder Mfg. Co. makers.

**The Westinghouse Machine Company,**  
 Pittsburgh, Pa.

## For Sale.

Old style slide valve engine in A 1 condition made by Hughes & Phillips. Cylinder 14 x 34, Pickering governor, about 80 horse-power. To be sold at a bargain. Address,

CARY MFG. CO.,  
 19-21 Roosevelt St., New York City.

# For Sale.

The entire plant of the UNITED STATES PIN CO., located at Seymour, Conn., on line of N. Y., N. H. & H. R. R. (Naugatuck Division), consisting of buildings, real estate and valuable water power on the Naugatuck River, including all machinery used by the above mentioned Company for the manufacture of pins.

For full particulars and price address

**United States Pin Co.,**  
Or Olin L. Dibble,  
Seymour, Conn

## WANTED.

A lot of second-hand Blast Pipe from 3 in. to 16 in. Must be in good condition.

**HAY-BIDDEN MFG. CO.,**  
254 North Henry Street, Brooklyn.

## WANTED.

Second hand engine about 20 in. x 30 in., with fly wheel, left hand, side valve preferred; 130 ft. 4 in. shafting. One pair of horizontal reversing engines, 9 in. x 12 in., or 10 in. x 13 in. Must all be in good condition. State price, condition and where can be seen.

Address "B.",  
P. O. Box 578, Pittsburgh, Pa.

## FOR SALE.

An old established Hardware House in a flourishing Western city. Business includes Iron and Steel, and is wholesale and retail. Address,

"RARE CHANCE."  
Care *The Iron Age*, New York.

## WANTED

For an extensive manufacturing plant in the middle west, the services of a thoroughly competent and practical mechanical engineer. Should be a young man of 30 to 35 years of age, well posted in rebuilding and remodeling factory buildings and equipments. Must be up-to-date in all respects and capable of suggesting and putting into practice improvements in methods and machinery and must have a thorough knowledge of foundry work. For the right man a good and permanent place is open.

Give references and experience, state salary expected and address

"S. B." No. 45.  
care *The Iron Age*, New York.

## FOR SALE.

Old established business of more than 50 years in a thriving New England city of over 100,000 inhabitants. Plumbing, Gas Fitting, Hot Water and Steam Heating, Roofing, Tin and Galvanized Iron work, Stoves, Ranges, Furnaces, etc., etc.

To a satisfied purchaser the whole or a controlling interest will be sold—present owner by reason of death in the family does not care to remain in active business. Address

"LEWIS," care *The Iron Age*, New York.

**COLLECTIONS,**  
ATTACHMENTS, REPLEVIN, BANKRUPTCY,  
By telegraph, telephone, or cable. **CREDITORS'**  
**LEGAL UNION**, offices, 302 B'way, N. Y.; 1 Montgomery St., Jersey City, N. J. Tel. 2871 Franklin.  
Cable, Credlegun, W. U. code.

## FOR SALE. Stock, Good Will.

Profitable wholesale-retail Hardware business, established 35 years. In perfect running order. Located in New York State. City of 50,000 inhabitants. Excellent R.R. centre, capital opportunity to secure a jobbing trade; have good profitable trade with leading builders, manufacturers, blacksmiths and country merchants. Stock approximately \$22,000, can be reduced quickly to \$12,000 or \$15,000. Correspondence and inspection invited. Address

GRISWOLD, MALONEY & CO., Owners,  
Elmira, New York.

## Hardware Business Established 17 Years FOR SALE.

This business has been carried on by the estate of Geo. Christie for three years and must be closed out

**MAY 1ST**

to settle up the estate. Location in the center of the business district on corner in new four-story brick building in Paterson, N. J. Elevator and Granite cellar (9' x 100 ft.). Lease to run two years and three months at \$1,280 a year. Cheapest rent in the city. Apply to

FRANCIS SCOTT, Trustee,  
Paterson Savings Building, Paterson, N. J.

## To Manufacturers.

I have an article in the Cabinet Hardware Line which is simple, practical and superior in every way to the one now in use. Patented February, 1900. No very intricate or extensive line of machinery is required to manufacture it. Its superiority and simplicity appeal at once to every one who sees it. The patent and all rights and interests will be disposed of at a very reasonable figure. This is an excellent opportunity for a manufacturer who has additional capacity, as there is undoubtedly a large market for the goods.

WM. L. ELDER,  
Indianapolis, Ind.

## Location For Plant.

Propositions for location of a large Hardware mfg. Plant, in town making proper proposition and with proper natural advantages, would receive consideration if reply addressed to

"HARDWARE MANUFACTURER."  
Care *The Iron Age*, New York.

## Factory Sites.

Persons seeking homes or investments, or firms and corporations seeking locations in the South, and who desire information about Tennessee would do well to address Robert Gates, Special Industrial and Immigration Agent, Louisville & Nashville R. R. for Tennessee, at Nashville, Tenn.

20 in. x 48 in. Corliss Engine.  
8 in. x 12 in. Ames  
8 in. x 12 in. Erie  
7 in. x 10 in. Porter  
6 in. x 10 in. Fayen Upright Engine.  
125 Horse Horizontal Boiler.  
20 H.-P. Upright Boiler.  
20 H.-P. Upright Boilers. New.  
2 Double Belts, Hoyt's make, 104 ft. x 18 in.; 186 ft. x 18 in. 1 Plate Planer, 16 ft., very heavy, built in Scotland. 1 Planer, Pond, 9 ft x 36 in., very fair order. 1 short Lathe, 48 in. swing. A number of small Lathes and Drill Presses. Hydraulic Riveting Machines, 36 in. gap. ROBERT J. GRAY, 52-54 East 133d St., New York.

## FOR SALE.

### Pipe Cutting and Threading Machine.

Machine complete, with countershaft, dies and cutters for cutting and threading pipe 16 inch and under.

NASON MANUF. CO.,  
71 Beekman St., New York.

## FOR SALE AT A BARGAIN.

A No. 9 Sturtevant Blower with countershaft on same Bed Plate. Blower in perfect order. Can be seen running.

THE SAMUEL L. MOORE & SONS CO.,  
Elizabeth, N. J.

## WANTED.

One mile of second hand, 30 lb. steel rails, with splices complete, for delivery by June 1st.

Five miles of second hand 4 in. wrought iron pipe, for delivery by June 1st. Address,

A. B. SMITH CHEMICAL CO.,  
Bradford, Pa.

## FOR SALE.

Very valuable Patent for making Graduated Mesh Poultry Netting.  
Address

"NETTING,"  
care *The Iron Age*, New York.

## FOR SALE

A small foundry 18 miles from New York, with advantageous railroad facilities. Small plant, excellent location, almost new; every convenience. Gray iron capacity about 25 tons per day. Malleable iron capacity 8 tons per day. For full particulars call upon or write

J. W. WOOLFOLK,  
15 Wall Street, New York.

## 2nd HAND.

Flather & Co.'s Fox Turret Lathe, tools and counter. A 1 condition. 36 in. Wood and Light Drill Press, power feed, back gear. 2 Ames 4-Spindle Drill Presses. 24 in. Harris Drill Press, counter attached to machine. 2 Lincoln Millers. 2 Phoenix Millers. 3 Hoisting Engines. 7 x 8 Gould Triplex Power Pump. 4 x 5 Baldwinsville Triplex Power Pump. Low prices make quick sales. Write for list.

HANNAN & FINTON,  
Springfield, Mass.

## HALF INTEREST FOR SALE.

Owing to ill health, partner in wood-working machinery plant situated in Central Pennsylvania offers his interest for sale. An exceptional opportunity for man with knowledge of the business, or for young man willing to travel in the interest of the same. Price is based on less than net value of half-interest and terms easy if desired. Cash consideration required not less than \$5000.

Address "W. G. E."  
care *The Iron Age*, New York.

A long established and profitable hardware business in the Teche country of Louisiana for sale, owing to the desire of the proprietor to retire permanently from business.

Address P. O. BOX 402,  
New Orleans, La.

**WIRES RODS,**  
**BILLETS.**  
TELEPHONES 1410-1411 JOHN.  
68 WALL STREET, NEW YORK.

**B. NICOLL & COMPANY,**  
IRON ORE and MILL CINDER.  
FOUNDRY, FORGE, BESEMER and BASIC PIG IRON.  
Steel and Iron Scrap for Open-Hearth Furnaces Bought and Sold.  
Furnace Agents, Exporters and Importers.

**FOR IMMEDIATE DELIVERY.**  
**Angles, Beams,**  
**Channels, Plates,**  
**Tees, Zees, Bars**

5000 tons in stock. Moderate prices. Send for stock sheet and quotations.

**STRUCTURAL DEPARTMENT,**  
**ILLINOIS STEEL CO.,**

Designers, Manufacturers and Erectors of Structural Iron Work, Dealers in Structural Materials.

50 Wabansia Ave., CHICAGO.

**BEAMS, CHANNELS,**  
**ANGLES, PLATES.**

Eye Beams, from 4 ins. (7½ lbs.), to 20 ins. (65 lbs.). Channels, from 4 ins. (5½ lbs.), to 15 ins. (38 lbs.). Angles, from 1¼ ins. x 1¾ ins. x 3-16 in. to 6 ins. x 6 ins. x 3½ in. Angles, from 2½ ins. x 2 ins. x 3-16 in. to 6 ins. x 4 ins. x 3½ in. Zee Bars, 3 ins. 4 ins. and 5 ins. Plates, 1¼ ins. and over.

All material in 50-ft. lengths or cut to specified lengths if desired. Send for detail stock list.

All material in stock, and will be shipped immediately on receipt of order.

Quotations subject to prior sale.

THE FOREST CITY STEEL & IRON CO.,  
 Cleveland, O.

**Wagon Tires,**  
**STEEL OR IRON,**  
**RD. EDGE OR SQUARE.**

Angles Up To Four Inch.

**LOGAN IRON & STEEL CO.,**  
**BURNHAM, PA.**

Buyers of Scrap for Cash.

**FOR SALE FROM STOCK.**

EYE BEAMS, from 8 ins. to 20 ins.

CHANNELS from 1¼ ins. to 15 ins.

ANGLES, both even and uneven leg, from 1 in. to 6 ins.

FLATS, from 1 in. to 20 ins. in width. Will cut to specified length and sell either plain, punched or riveted.

BUILDING and STRUCTURAL IRON of all descriptions.

BELMONT IRON WORKS,  
 23d and Washington Ave., Philadelphia, Pa.

**E. BISSELL & CO.**  
 WHOLESALE

**HARDWARE AUCTIONEERS,**

12 Murray St. and 15 Park Place, N. Y.  
 Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

**FOR SALE.**

**CAR SHOP WOODWORKING TOOLS.**

1 four-spindle horizontal Boring Machine, Greenlee Bros. & Co.

1 No. 4 Variety Woodworker. J. A. Fay & Egan Co.

1 No. 3 Band Saw. J. A. Fay & Egan Co. Used four months.

VULCAN IRON WORKS,

30 Milwaukee Ave., Chicago.

**FOR SALE.**

1000 tons 50 lb. steel relaying rails with angle bars, in first-class condition, delivery on line of Chicago & Alton R.R.

500 tons 60 lb. steel relaying rails and angle bars, East St. Louis.

About two and one-half miles 67 lb. steel relaying rails, with angle bars, f.o.b. cars Richmond, Va.

100 tons 40 lb. iron relaying rails with fastenings, f.o.b. cars Cincinnati, Ohio.

About 100 tons of good second-hand 16 lb. Iron Rails, f.o.b. cars Cincinnati.

Several locomotives of various types.

ISAAC JOSEPH IRON CO.,  
 Swift Building, Cincinnati, Ohio.

**WE PURCHASE FOR CASH**

Scrap Iron and Scrap Steel and Metals of every description.

M. SAMUEL & SONS,  
 Kent Ave. and North 2d St., Brooklyn.  
 Washington and Bethune Sts., New York.  
 Relaying rails on hand cut to any lengths.

**FOR SALE.**  
**RELAYING RAILS, ETC.**

450 tons 60 lb. Steel Relaying Rails with Angle Bars.  
 300 tons 50 lb. " " " Fastenings.  
 150 tons 40 lb. " " " Splices.  
 Box, Flat and Gondola Cars, new and second-hand.

MAY & SPALDING,  
 32 Broadway, New York and Atlanta, Ga.

**FOR SALE**  
**Relaying Rails.**

100 tons 56-lb. Steel, with angle-bars.  
 400 tons 45-lb. Steel, with Fisher joints.  
 720 tons of 56-lb. New Steel Rails.  
 Tidewater delivery.

THE STEEL RAIL SUPPLY CO.,  
 100 Broadway, New York City.

**Relaying Rails**  
**For Sale.**

16 and 20 lb. Steel Relaying Rails with splices, Louisiana.  
 25 lb. Steel Relaying Rails with splices, Michigan.  
 40 lb. Steel Relaying Rails with splices, Ohio.  
 50 and 60 lb. Steel Relaying Rails with splices, Pennsylvania.

All first-class condition, subject to any inspection. Immediate shipment.

HYDE BROS. & CO.,  
 Lewis Block, Pittsburgh, Pa.

**Relaying Rails For Sale.**

100 tons 20 lb. with splices.  
 50 " 30 " " "  
 20 " 40 " " "  
 70 " 45 " " angles.  
 Also 67, 56 and 16 lb. small lots.

DONALDSON & NEWTON,  
 421 Chestnut street, Philadelphia.

**WANTED.**  
**Scrap Iron and Steel**

Correspondence solicited.  
 C. Botjer, 405 Newark St., Hoboken, N. J.

**F. R. PHILLIPS & SONS CO.**

Have removed to their new offices,

**302-303 Harrison Building,**  
**PHILADELPHIA.**

Iron and Steel Rails,

Melting Scrap, &c.

**Ice Skate For Sale.**

Two patents, Dies, Special Machinery, Stock, Etc. Low price for cash. Send for our list of Patents.

P. O. BOX 2294, Boston, Mass.

**Scrap Iron, Steel & Metals**

**New Jersey Iron & Metal Co.,**

PATERSON, N. J.

Write us when you have Scrap to dispose of or want to buy.

**Scrap Iron, Steel and**  
**Iron Rails**

bought and sold by

M. J. & M. BLAKE,

10th Ave. and 15th Street,  
 New York City.

Telephone Call, 807 18th St.

JOHN LEONARD. MICHAEL BLAKE.

**JOHN LEONARD & CO.**  
 IRON AND STEEL SCRAP,

IRON AND STEEL RAILS, PIG IRON, ETC.

220 BROADWAY,

ST. PAUL BUILDING, NEW YORK.

TELEPHONE, 975 CORTLAND.

Correspondence solicited.

**The Morton B. Smith Co.,**

243 FRONT ST., NEW YORK.

**OLD METALS**

of every description purchased for cash, also

**SCRAP IRON and STEEL**

In car load lots.

Correspondence solicited.

**FOR SALE.**

300 tons of original 65 lb. relaying steel rails, present weight about 62 lbs.

RICHARDSON & COMPANY, Inc.,  
 Pittsburgh, Pa.

**W. H. Perry Co.,**

Providence, R. I.,

BUYERS OF

**SCRAP IRON**  
**AND STEEL.**

**FOR SALE.**

About 600 tons Relaying 60 pound steel rails with fish plates complete. Delivery immediate in 100 ton lots.

Also

135 to 150 tons new 52 pound steel rails, Penna. Steel Company's make; together with flat splice bars, bolts and spikes.

L. & R. WISTER & CO.,

672 Bullitt Bldg., Phila., Pa.

I buy Iron and Metal Scrap and wish to hear from anybody having cotton ties, pipe, hoops, cast borings, wrought and steel turnings, boilers, cast scrap, etc. Also wrecks from fire, etc.

ROBERT M. CUNLIFFE,  
 1140-42 Washington Ave., Phila., Pa.

**BERKSHIRE IRON YARD,**

M. H. ROGERS, Owner.

**Scrap Iron, Metals, Etc.**

221-223-225 Housatonic Ave.,

BRIDGEPORT, CONN.

TELEPHONE.

## Where to Locate.

Manufacturers using iron, steel or wood will find the best locations for successful plants along the

### SOUTHERN RAILWAY.

These locations lead in cheap raw material, cheap, contented and desirable labor, cheap fuel and in good facilities for marketing products. Opportunities now open for establishing new plants are fine and should be investigated. Other investments will prove profitable in the South.

M. V. RICHARDS,

Land and Industrial Agent, Southern Railway,

WASHINGTON, D. C.

## FOR SALE, SECOND-HAND TOOLS.

One "Newton" Cold Saw.

Three "Bryant" Cold Saws.

One "Whitcomb" Planer, 37 in. x 36 in. x 9 ft.

One Horizontal "Hilles & Jones" flange or angle punch, 7 in. throat; will punch  $\frac{1}{8}$  in. through  $\frac{1}{2}$  in.

One "Cockburn" Concrete Mixer.

One "Sturtevant" Blower, No. 8.

One do. do. No. 5.

ALSO

**NEW CORNELL BLOWERS**—Poole's patent, all sizes—the best in the market—send for prices.

J. B. & J. M. CORNELL,  
26th St. and 11th Ave., New York City.

## FOR SALE.

One steel ladle, 17,000 lbs. capacity, and one steel ladle, 22,000 lbs. capacity, both arranged for bottom pouring.

Also one Seller's centrifugal sand mixer, with a 220 volt motor attached direct. This machine is as good as new, as it has not been run more than one week. Apply to

THE BENJAMIN ATHA & ILLINGWORTH CO.,  
Newark, N. J.

## CAPITAL WANTED.

Party having a large and profitable trade wants to interest parties with from \$10,000 to \$20,000. to engage in the hardware business in a city of over 200,000 population. A paying business guaranteed from the start. Address,

"PROFIT,"  
care The Iron Age, New York.

## FOR SALE.

An old established manufacturing business. Moulding, Stamping and Finishing Brass and Metals. Always paid but must be enlarged; capital necessary, \$15,000 to \$20,000. Address

"OPPORTUNITY,"  
care The Iron Age, New York.

## Capital Wanted

to more fully work a Mechanical appliance for Steam Plants. Demand extensive. Profits large. Investor privileged to fill salaried position. Address

"CORPORATION,"  
care The Iron Age, New York.

## FOR SALE.

Stock of Hardware, Stoves and Tinware, located in a city of 5,000, in the centre of the finest agricultural district in Central Indiana. Stock about \$6,000. Owner has other interests demanding his attention. Address

"I. N. D."

care The Iron Age, New York.

We buy old

## RUBBER.

Write, if you have anything to offer.

**WALSH'S SONS & CO., Newark, N. J.**  
Iron Machinery, &c.

## 5% FIRST MORTGAGE GOLD BONDS.

I have a limited amount of Bonds of a Southern Iron Mining Company owning ore producing properties of especial merit and having a ready market for all its product.

The properties are in fine running order and are yielding handsome profits.

The Bonds are offered at par with a bonus of fifty per cent. of the amount of bonds taken, in the stock of the Company. The stock is full-paid and non-assessable. The bonds are sold on subscription, to be delivered on May 1.

This is an exceptional opportunity.

Closest investigation is invited from those who desire to invest.

Address "GOLD BONDS,"  
care The Iron Age, New York.

## Manufacturing Business For Sale TO SETTLE AN ESTATE.

Has been established over fifty years, present reputation first-class and advertised world wide. Factory located between two streets, entrance from either, and electric pass the door; built of brick; three floors and basement with line of shafting. Attic suitable for storage. To the party meaning business, full particulars will be given and can be seen at any time. Address,

I. LATHE,  
Station A., Worcester, Mass.

## WANTED.

Agency for Mill making high-grade Crucible Steel. Well acquainted with Eastern trade, or will invest from \$8,000 to \$10,000 in an established business

Address "C. M. P."  
care The Iron Age, New York.

## STEEL TRUSSES.

We want to buy a number of steel trusses to carry a roof, span from 60 to 80 feet. Also other iron work for large foundry building. Second hand, or new if cheap. Address

"TRUSSES,"  
care The Iron Age, New York.

## PARTNER WANTED.

Good, practical, all-around sheet metal worker and mechanic as shop foreman who can invest from two to three thousand dollars in established Chicago firm manufacturing high grade galvanized steel and goods sold throughout the country. Business perfectly safe, legitimate, steadily growing; additional means required for increase. A first-class opening for a desirable party. State experience, age, particularly fully. References exchanged. Address

"PARTNER,"  
care The Iron Age, Fisher Bldg., Chicago, Ill.

## PIG IRON, COAL, COKE.

A German firm with first-class connections in the Rhenish-Westphalian district is willing to represent first-class firms in above mentioned lines. Offers address "K.D." 4078 Rudolf Mosse, Düsseldorf, Germany.

## Scrap Wanted.

Heavy and Light Steel Melting Scrap, also Heavy Cast Machinery Scrap, such as housings, gearings, rolls, etc. Send full description of material with lowest cash price.

F. GREINER,  
406 Drexel Building, Philadelphia, Pa.

## ORES FOR SALE.

Following ores are offered for sale for delivery during the year.

Manganese.	Iron.	Silica.	Phosphorus.
No. 3 A.	53.95	20.40	.15
No. 5 A.	13.16	36.09	.10
No. 3		55.11	.45
No. 4		42.80	.58

Tonnage, shipping points, prices and particulars on application to

GEO. B. HOOKER,  
618 Pa. Ave. N. W., Washington, D. C.

## FOR SALE.

1 48 in. x 10 ft.  
1 24 in. x 7 ft.  
1 18 in. x 5 ft.

Two small Hand Lathes, 30 in Drill, Pattern Makers' Saw, large Grindstone and Frame, 1500 lb. Scales, large safe, Barrel Oil Tank, Hand Bolt Cutter and a good assortment of Blacksmith Tools. Cheap for cash.

LEONARD D. HARRISON,  
144 Hallock Ave., New Haven, Conn.

## AUCTION SALE.

Entire stock of Furnaces, Ranges and Repairs. Patterns and good will. Complete Tinsmith tools, Plumbers' tools and Threading Machines. Also office furniture, safe, new Remington Typewriter, etc. Tuesday, April 24, 10 A.M.

SIMONDS FURNACE CO.,  
50 Cliff St., New York.

## WANTED.

One Screw Machine.  
One 36 to 42 inch Planer, bed 10 to 12 feet.

One Lathe, 40 in. swing, 10 to 12 ft. bed.

New Die Sinking Machine.

New or second-hand

Address with full particulars,

"PLANER-LATHE,"  
care The Iron Age, Cuyahoga Bldg., Cleveland, O.

## THE LATEST BOOKS.

**History of a Pool.** Reprinted from The Iron Age. Describes accurately in narrative form one of the methods of forming and carrying on pools. 109 pages, pamphlet.....\$25c.

**The Ironville Hardware Association.** Reprinted from The Iron Age. Deals with the prevailing evils of unreasonable competition existing in the hardware trade, presenting in narrative form the policy and procedure of a local combination of merchants. 79 pages, pamphlet.....\$25c.

**Formulas and Tables for Heating.** Being German formulas and tables for heating and ventilating work for those who plan or erect heating apparatus. By J. H. KIRKALY, prof. M.E., Wash. University. 56 pages, leather.....\$1.00.

**The Practical Stone Cutter and Mason's Assistant.** Being a collection of every day examples, showing arches, retaining walls, buttresses, skew arches, vaults, domes and semi-domes, quoins, grolins, etc., with explanations of the most approved and economical methods of working them out; together with a copious description of the tools used by stone cutters showing methods of use, etc. etc. By FRED T. HODGSON, architect. Over one hundred explanatory illustrations. 75c.

**A Treatise on Masonry Construction.** Ninth edition, revised and partially rewritten. By IRA O. BAKER. Cloth.....\$5.00.

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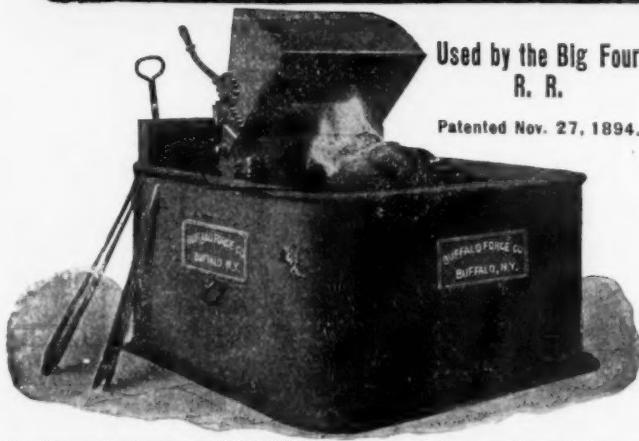
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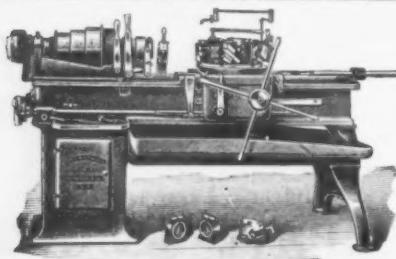
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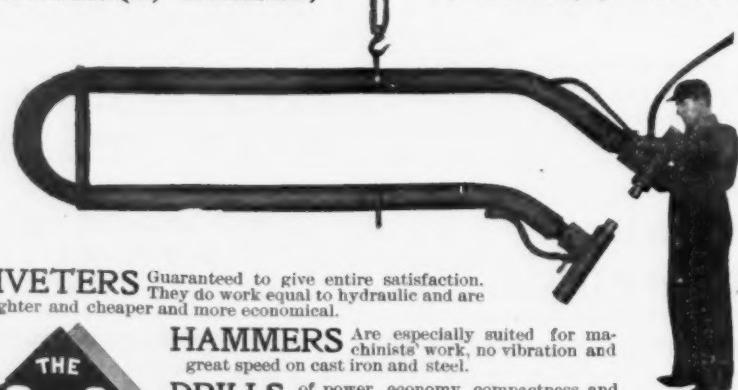
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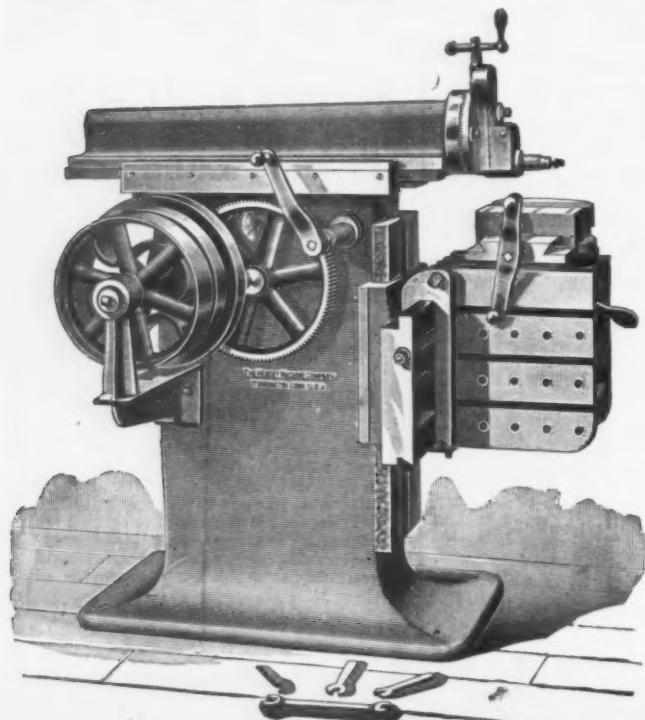


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# THE IRON AGE.

THURSDAY, APRIL 12, 1900.

## The Brown Automatic Furnace Charging Machine.

A furnace hoist and stock distributor which embodies a number of new features has just been installed by the

others at the works of the Société John Cockerill, at Seraing, Belgium. Illustrations are presented herewith.

The apparatus is designed for the automatic charging of blast furnaces, and dispenses entirely with the employment of top fillers, all operations being conducted by one man located on the engine at the base



THE BROWN AUTOMATIC FURNACE CHARGING APPARATUS.

Brown Hoisting & Conveying Machine Company of Cleveland, Ohio, at the plant of the Stewart Iron Company, at Sharon, Pa. Strictly speaking, this is the second hoist and distributor of this type which has been installed, the other having recently been erected at the plant of the National Steel Company, at Zanesville, Ohio. Several installations are also being made abroad, among

of the hoist. The hoist consists of an inclined iron truss bridge reaching from the floor of the stock house to the top of the furnace shell, and thence over the top of the furnace. On this bridge is laid a track of T-rails on which travels a skip or car, containing a charge of from 1 to 3 tons, as may be desired. In the case of the Sharon plant, where the improved hoist has just been installed,

the height of the furnace to the top of the platform is 78 feet, and the total length of the hoist is 105 feet. The capacity of the skip is 100 cubic feet. The track is so arranged at the top that the contents of the car are automatically dumped into the hopper on the arrival of the car at the top. This inclined bridge displaces the usual hoist house or tower and the bridge leading from it to the furnace top.

The skip car is hoisted or hauled to the top by a two-cylinder engine with a friction clutch drum located at the foot of the bridge, and the skip is lowered to the bottom for the refilling by means of a powerful foot brake without reversing the engine. The top hopper is covered by a conical built up structure with an opening about 4 feet square, and also equipped with explosion doors, and this rests on the top ring of the furnace and covers the bell and hopper. The lowering and raising of the bell is accomplished by a simple device under the control of the operator.

The hoist starts from a pit in the stock house, and is secured to the top of the shell of the furnace by abutment, lugs and pins. The engine employed for hoisting purposes is so arranged as to hoist the load to the proper height, and automatically prevent overwinding by means of a safety throttle valve designed for the purpose. The skip car is constructed with one set of narrow tread wheels in front and a set of double tread wheels in the rear. The gas seal door is connected by means of levers to the bed rod, so that when the bell is lowered the door closes and thereby prevents the escape of gas. The door is held open when the bell is up, thus preventing the bell and hopper from becoming overheated, which would occur if a free circulation of air was prevented. The bell is operated by the ordinary lever and air cylinder. A four-way valve of special design is located on a convenient stand in the engine room and connected to the air cylinder and drum by pipe connections, so that all the manipulations of charging the stock by means of the bell are readily performed by the engineer at his post.

Near the operator and in plain view is a large dial with a pointer or indicator, which, every time the bell is lowered, shows the exact height of the stock in the furnace. This can also be registered automatically on paper by an attachment which can be kept under lock and key, which gives the record of stock line at all times, and also enables the manager to ascertain the uniformity of charging during his absence. The dial of the register is of such size that for a 1-inch movement of the bell there is a 3-inch movement of the pointer on the dial. There is also a register which indicates the number of skip cars charged into the hopper before the lowering of the bell, thus preventing over or under filling of the bell before it is lowered. Danger of overhoisting is avoided, as has been explained, by a safety stop, so constructed that when the drum has made the requisite number of revolutions to effect the desired hoist the steam supply valve is automatically closed, so that the skip car is stopped in its proper position for dumping, and cannot go beyond, as the cutting off of the steam stops the engine.

The skip car descends into a pit at the lower end of the bridge, so that its front or open end is on a level with the stock house floor. The bottom filling is, therefore, so much easier than when empty barrows have to be removed before full ones can be put upon the ordinary hoisting cage that the labor of one or two men, each 24 hours, is, in some cases, saved in the bottom filling alone. All the work of hoisting stock and filling the furnace is easily performed for 12 hours by one man with perfect regularity, and he, as well as others in the stock house, is informed of the exact height to which the furnace is filled at the dropping of each charge.

The patent stock distributing hopper which is used in connection with the hoist is so arranged as to insure any desired predetermined order of distribution of stock in the furnace. The distributor itself is a cone shaped built up structure with an oval spout leading out underneath it and at one side, the top of the distributor being equipped with annular gear. The distributor is supported on steel rollers or ball bearings, and these bearings in turn are supported by the conical built up structure which rests on the top ring of the furnace. As each trip of the skip is made, this distributing cone is revolved a certain portion of an entire revolution by means of a suitable gearing connected with the hoisting mechanism and engaging with the ring of the cone. The entire revolution can be divided into as great a number of parts as may be desired to suit the distribution of stock and the ideas of the management.

When the skip load is dumped into the conical hopper it runs through the oval spout at the bottom, and is thrown into that portion of the regular hopper which is in front of the opening. The next skip load is obviously thrown into a new position, and, if the distributor is set, for instance, to make an entire revolution in four trips, each skip load would be thrown into a separate

quarter of the regular hopper. The usual practice is to make the subdivisions of the entire revolution a whole number and fraction—that is, instead of dividing the revolution into four, six, &c., equal parts, it would be divided into four and one-half parts or six and one-half parts, so that the skip loads would begin to overlap each other after the distributor had made one entire revolution. When the skip is hoisted the distributor remains stationary, owing to a slip or ratchet coupling, which is introduced between the hoist sheave and the distributor. With the distributor arranged to move any desired portion of a revolution between each skip load, it will give any desired distribution and any desired composition of the charge.

#### The Foundrymen's Association.

The ninety-seventh meeting of the Philadelphia Foundrymen's Association was held on Wednesday evening, April 4, at the Manufacturers' Club, 1409 Walnut street, Philadelphia. H. O. Evans of Thomas Devlin & Co. read the paper, which we reproduce elsewhere, on "Shrinkage of Malleable Iron Castings." James D. Stirling read a paper by Dr. Edward Kirk, also reproduced elsewhere,



Skip in the Act of Dumping.

#### THE BROWN AUTOMATIC FURNACE CHARGING APPARATUS.

entitled "Should a Foundry Chemist be a Practical Melter as Well?"

A talk on Africa, illustrated by over 60 stereopticon views, by Jas. H. Birch of Burlington, N. J., proved a most interesting event, a vote of thanks being tendered Mr. Birch after the lecture.

A buffet lunch was served at 10.30 o'clock, at which a number of impromptu speeches were made. Mr. Rankin, the president, called the attention of the association to the rapidly increasing membership of the labor unions, and of the boast of the Molders' Union that Philadelphia shops were unionized almost to a man.

L. Tack, a Roumanian iron founder, gave a brief outline of the conditions existing in his native land, and contrasted the great differences in prices of fuel, wages, &c., in America and Roumania.

The maintenance of prices was the theme chosen by E. E. Brown, and a continuance of the same subject, together with the ruinous practice of selling goods without a positive knowledge of their manufacturing cost, was dwelt upon by W. H. Pfahler, who also briefly stated the benefits derived from membership in foundrymen's associations.

E. S. Cook of the Warwick Iron Company spoke of the progress of chemistry in the foundry and blast furnace, the subject being very appropriate owing to the reading of Dr. Kirk's paper at this meeting. Mr. Cook's opinion was that in his experience the average chemist was not a practical melter.

A. C. Pessano referred to the strength of the Molders' Union and the protection afforded members of the National Foundrymen's Association against the demands of organized labor.

## The Paris Machinery Exhibits.

### EDITORIAL CORRESPONDENCE.

PARIS, March 30, 1900.—The great Machinery Hall of the Paris Exposition of 1889 is now being fitted with a variety of booths and buildings to receive exhibits quite different from those to which it was then devoted. Parallel to it, on the Eiffel Tower side, extend two open sheds on either side of a wide aisle which connects the old with the new Machinery Hall, the latter being the connecting transept between the two long main exposition buildings of the Champ de Mars. On either side these boiler sheds are flanked by a highly ornate chimney, 80 meters (262½ feet) high, built by Nicou & Demarigny of Paris. Facing the direction of the Eiffel Tower the

#### Boiler Plant

on the right is in two rows, and includes four batteries of L. & A. Niclausse boilers, built in Paris, and three by N. Roser of St. Denis, both pretty far advanced. The Compagnie Five-Lille has three partly erected, as are also two by A. Montufret of Paris, six by De Naeyer & Cie. of Prouvy, Nord, and six by the French Babcock & Wilcox Company. One space arranged for a series of three boilers is still entirely empty. Following the general direction we reach the wide connecting structure between the old and the new machinery halls, and there, largely under the galleries, is the space allotted to the United States, in which very little in the way of machinery is in place. On the adjoining space, that of Holland, there is being erected a moderate sized horizontal compound engine, coupled direct to a dynamo, by Stork Frères & Co. of Hengelo. Beyond, in the space reserved for Hungary, there is being erected a double triple expansion vertical engine by Boeckli of Ivesop, and near it, in the Austrian section, a horizontal compound engine coupled direct by Ganz & Co. of Leobersdorf. In the Hungarian section work has also well advanced on a compound horizontal engine by Ganz es Tarsa of Buda Pesth, and a vertical compound by F. Ringhoffer of Smichow, Prague.

We have now advanced to the second group of boilers, there being arranged right and left two groups of three each of Galloway boilers. Beyond are fairly well advanced four batteries of boilers by De Naeyer & Co., two by Billaud & L'Hermite of Paris, also of the water tube type. Next is an empty space, followed by four batteries of Babcock & Wilcox, three by Steinmueller of Cummersdorf, Germany, and four, also a water tube boiler, from Petry-Dereux of Dueren, Germany, the line being completed by a three-flue horizontal boiler erected by Ewald Berninghaus of Duisburg, Germany. On the other side a purifying plant is going up for the Société Anonyme l'Epuration des Eaux, two water tube boilers by Ewald Berninghaus, one by Petzold & Co. of Inowrazlaw, and one by Simonis & Lanz of Frankfort-on-Main. Although there are a number of gaps the boiler plant thus constituted is pretty well advanced and it looks as though there need be no serious delay from that source.

#### Other Machinery Exhibits.

Turning now to the adjacent new Machinery Hall proper we find first in line along the main aisle the German section and meet first with one particularly fine group of large engines, which are either completely installed or are very close to completion. First on the left is a large compound vertical engine by W. Lahmeyer of Frankfort, and on the other side a handsome vertical triple expansion engine coupled to a large dynamo by Schuckert & Co. of Nuremberg. The third is a very large quadruple expansion horizontal engine by the Vereinigte Masch. Fabr. Augsburg & Masch. Bau Gesell. Nurnberg of Augsburg, coupled to a very large dynamo by the "Helios" of Cologne. The fourth in the group is a vertical quadruple expansion engine built by A. Borsig of Berlin, coupled to a huge dynamo by Sie-

mens & Halske of Berlin. A traveling crane by Carl Flohr of Berlin has been used in the erection. The balance of the German space is not as yet occupied, with the exception of a large compound semiportable engine by R. Wolf of Magdeburg.

In the main hall, back of the German section Switzerland is rapidly filling well a pretty large area. Your correspondent noticed machinery in course of erection by Cousin Mider of Morges, by the Ateliers de Construction Burckhardt of Basle, by Theodor Bell & Co. of Kriens, and by Baden, Brown, Boveri & Co. A fine horizontal tandem compound engine coupled direct to a dynamo is being erected by Esher, Wyss & Co. of Zurich, while small triple and compound vertical engines coupled direct to dynamos are in place from the Compagnie de l'Industrie Electrique of Geneva, and the Ateliers de Constr. Oerlikon of Zurich. The Gebrueder Sulzer of Winterthur are putting up a quadruple expansion horizontal engine, and a horizontal compound fly wheel engine by Ak. Gesell. J. J. Rieter & Co. of Winterthur is well advanced.

Returning to the main aisle, we need cast only a glance at the space reserved for Great Britain, since thus far only the foundations are visible, besides some heavy bed plates to form a part of the exhibit of Williams & Robinson. Not a man was at work in this section.

Belgium faces the main aisle and has a large space extending far back into the main hall. The show positions are occupied by a fine compound horizontal engine by H. Bollinx, while work has been begun on a large compound engine by Van den Kerhove of Gand and on another by Carels Frères of Gand, which drives a dynamo built by the Elektro. At S. de Kolben at Spool Praha. The completion of foundations and the first work of installation is all that has been accomplished in the rest of the Belgian space, except in the case of a very massive horizontal rolling mill engine by J. Cockerill of Liège and a two-flue boiler in place by the Etablissements Jacques Piedboeuf of Jupille.

Very little machinery is in place in the Russian and Swedish sections under the dark gallery and hardly more can be said of the exhibit of the United States.

The entire other side of the hall, fully one-half, is occupied by French exhibitors, who, generally speaking, are very far behind, especially those away from the main aisle. Among those occupying spaces along the latter, we note Farcot, with a fairly advanced horizontal engine, Dujardin & Co. of Lille started with a horizontal engine of moderate size, and Piguet & Co. of Lyon with a similar machine. A vertical engine of considerable size is being erected by the Soc. Française de Constr. Mécaniques, Cail, and the Société Alsacienne of Belfort is in a similar position. A neat group of smaller horizontal and vertical engines from the shop of E. Garnier & Faure of Beaulieu are well advanced. Some very handsome larger horizontal engines, one of them coupled to a large dynamo, which are nearly completed, are exhibited by Weyber & Richemond of Pantin, Seine. An adjoining space shows merely the foundations.

In the main body of the French section, even the boxes are not yet at hand, but since the great majority of the exhibits apparently will be of a lighter character a few weeks may make a great difference. Among the machinery in course of erection your correspondent observed some presses by Moraine Ainé of Paris, a large machine for cutting expanded metal by the Compagnie Française du Metal Deployé, and some machine tools by Maison Colmant, H. Ernault, Paris, and by the Usines Boubey of Montlucon.

C. K.

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According to a compilation made by the New York *Journal of Commerce*, the new companies with \$1,000,000 and over incorporated during the month of March had an aggregate capitalization of \$502,900,000. To this sum the New Jersey corporations contributed nearly \$300,000,000, the new Carnegie Company alone having a capital of \$160,000,000. The American Sheet Steel Company came second with \$52,700,000 capital.

## The Westinghouse-Parsons Steam Turbines

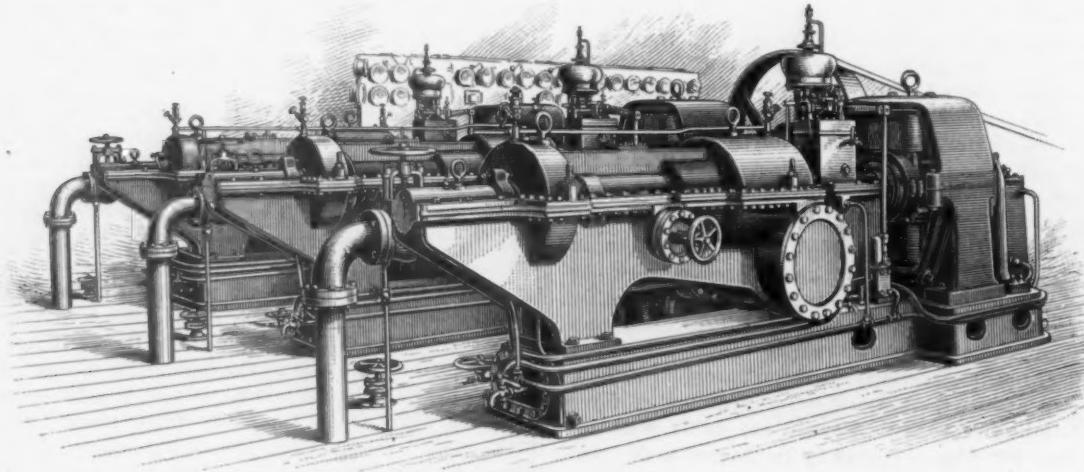
### Operating Westinghouse Air Brake Works.

The steam turbine is a radical departure from other forms of engine, although it is a little strange that it returns to the principle of the earliest form of the application of steam, since the energy of the steam is converted directly into kinetic energy by utilizing the impact and reaction due to the velocity of the steam.

For several years English publications have afforded descriptions of the steam turbine invented by Charles Parsons of Newcastle-on-Tyne, more especially in its application to torpedo boat service, and to the "Turbinia." In 1896 the Westinghouse Machine Company, East Pittsburgh, acquired the patent rights for the Parsons steam turbine in the United States and Canada, and they have since been engaged in developing these machines, and in introducing modifications and changes in their details, which have resulted in marked improvements over machines designed and built but a short time ago. Although up to the present time very little has appeared in print upon this subject, work has been steadily progressing, an engineer for years identified with the Parsons turbine in England having devoted his time exclusively to the turbine department of the Westinghouse Machine Company. It is the practice of the company to quietly conduct experimental work, and to bring their

although there is ample space for all purposes. The bed plate of each machine measures 16 feet 7 inches by 4 feet 3 inches. The whole plant, including two 10 horse-power steam engines operating generators for exciter purposes, two pairs of condensers and air pumps, and the switchboard, occupies a space of only 29 x 36 feet. The foundations consist of ordinary brick piers, without any holding down bolts, which are unnecessary on account of the absence of heavy reciprocating parts.

The speed of the turbines and generators is 3600 revolutions per minute. The weight of each complete turbine and generator is 25,000 pounds. The turbines are designed for condensing the exhaust, which is accomplished by means of a combination of a pair of jet condensers and compound air pumps, in which the air and water are handled in separate cylinders. The condenser pumps are operated by a 50 horse-power belted Westinghouse type "C" motor, taking current direct from the bus bars. The vacuum is often as high as 28 inches, while the average barometer is 29.25 in Pittsburgh. The delivery water is only a fraction of a degree different in temperature from that of the steam in the condenser. The thermal operation of these turbines is very striking, for although the live steam entering



THE WESTINGHOUSE-PARSONS STEAM TURBINES.

product to a high state of perfection before making the results public, and to test the devices thoroughly by operation in their own works. For this reason the first large installation of steam turbines in this country has been made in the power plant of the Westinghouse Air Brake Company, at Wilmerding, Pa., where they have been in active operation for several months driving electric generators. These extensive works depend entirely upon these machines for motive power and lighting, which fact demonstrates extreme confidence in them.

#### The Power House.

The power house of the Westinghouse Air Brake Company has eight water tube boilers, 350 horse-power each, working at a pressure of 125 pounds, equipped with Roney mechanical stokers. From the adjoining engine room the old steam engines have been removed, and the space is partly occupied by three steam turbines directly connected to generators, Fig. 1. Each unit consists of a 500 horse-power turbine, direct coupled to a 300 kw. 2-phase alternating current generator, the three units being run in parallel to furnish current for the entire works. There are two exhaust openings, so that the exhaust pipe may be connected to either side of the machine. The governor connection to the admission or governing valve and the throttle valve are shown. The generators are at the right, and the switchboard appears over the turbine. A plan and elevation of one of the 500 horse-power turbines is shown in Figs. 2 and 3.

The first thing that strikes the observer is the extremely small floor space occupied by these machines, for although they aggregate 1500 horse-power, yet, standing side by side, the space occupied is only 25 x 20 feet,

the turbines at 125 pounds pressure has a temperature of about 350 degrees, yet the exhaust temperature at a point about 4 feet distant is only a trifle over 100 degrees, the exhaust pipe being cool enough to be handled comfortably. This is a remarkable exhibition of the transformation of heat into work, and the condensation must be slight, if any, or the closely fitting parts would not operate so smoothly at this high speed. The mechanical construction of the turbine causes the energy to be taken out of the steam progressively, and the temperature falls gradually and continuously from the admission to the condenser. In this respect the turbine has an immense advantage in efficiency over other forms of steam engines, as in the highest type of expansion steam engine the pressure of the released steam is usually not less than 6 pounds, whereas with the turbine it is released at the limit of the condensers, which is from 1 to 1½ pounds.

#### The Turbines.

A cast iron base supports a cylinder enlarged in three steps from the inlet to exhaust, in the interior of which numerous parallel rows of guide blades or curved vanes about 3 inches in height are fastened. Revolving within, a shaft carries drums corresponding in diameter to the three sizes of the cylinder. Upon these drums are mounted other parallel rows of guide blades or curved vanes about 3 inches in length, secured radially and spaced to fit between the rows fastened to the inside of the cylinders. This method of construction affords an annular chamber for the passage of the steam upon the inner circumference of the cylinder. The steam enters at full boiler pressure and flows through this chamber parallel with the shaft through the interstices be-

tween the rows of fixed and movable blades until it reaches the exhaust chamber. The shape of these blades is the result of a great deal of study and experiment, that they may take up the whole velocity of the steam and convert it into useful work. The stationary rows are inclined in such a way that they guide the steam in the proper direction for doing work upon the movable ones, and a rotating movement is thus given to the shaft. As there are 58 rows of blades upon the drums, the steam is utilized that number of times for imparting motion to the shaft.

The steam enters the small end of the cylinder, and in expanding through the first set of guide blades its energy is transformed into velocity, and in impinging against the next set, which are on the smallest drum of the shaft, it gives up nearly all of its velocity. In expanding through the moving blades the steam again attains velocity and bounds back to strike the stationary vanes of the next ring and bounds again into the next moving blades, and so on through the successive rows of movable and fixed blades. In each of the three steps of the cylinders are several grades of expansion, afforded

it is piped down into an oil cooling system, where it is cooled by circulating water on account of the heat absorbed from the steam passages.

A novel and important feature with regard to the lubrication of steam turbines consists in the fact that there is no internal lubrication, and, in consequence, no oil comes into connection with the steam. This greatly facilitates the working of the surface condensers, as the condensed water can be pumped back to the boiler without any admixture of oil.

To counteract the end thrust on the shaft due to the axial impact of the steam on the moving blades, the shaft is held in equilibrium by means of three balancing disks at the right of the machine, as seen in Fig. 1, where the steam enters the cylinders, the disks being contained in the turbine casing. The disks are pistons rotating in their cylinders, with the steam pressure on one side, and are made steam tight with the cylinder, and the diameter of each one is equal to the diameter of the corresponding drum upon the shaft driving the moving blades. These disk chambers are connected by core passages through the cylinder casing with the spaces

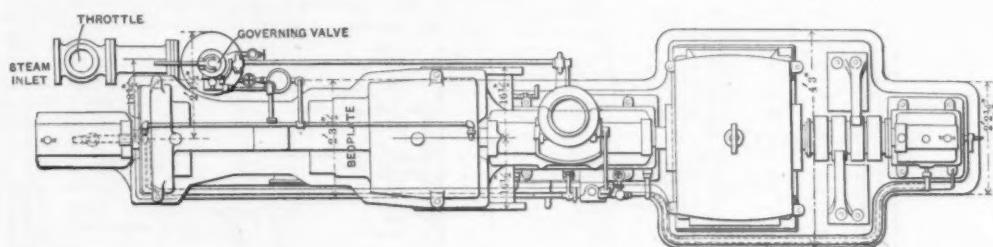


Fig. 2.—Plan 500 Horse-Power Turbine.

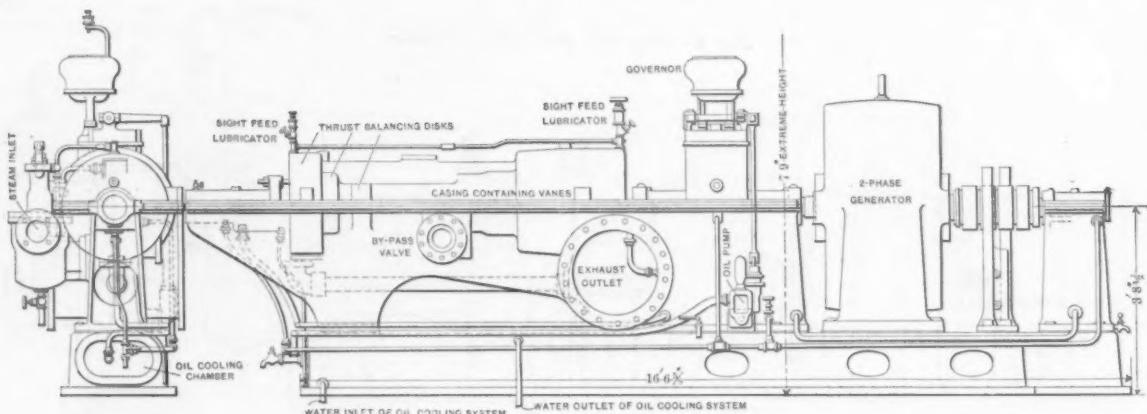


Fig. 3.—Elevation 500 Horse-Power Turbine.

#### THE WESTINGHOUSE-PARSONS STEAM TURBINES.

by increasing the spaces between the rows of blades and by placing the blades further apart, so that the power given up by the steam to one row of blades is again made up by its expansion before reaching the next row. This action is repeated until the steam reaches the exhaust chamber. The turbine is thus a multi-expansion engine with as many expansions as there are rows of blades. The total expansion ratio between inlet and exhaust is 96 to 1.

The bearings are a special patented construction on account of the high rotative speed and to eliminate all vibration and permit the shaft to revolve on its axis of gravity instead of the geometric axis. The bearings are made of several concentric sleeves of brass surrounding the journal, and fit each other loosely, allowing annular spaces for oil between them. This forms a self centering cushion, which has a tendency to reduce the vibrations of the shaft, and permits it to center itself when running. The tubes show no signs of wear, because of the films of oil between them, the oil forming the real bearing. The shaft is not rigidly confirmed, and the slight latitude of motion of the shaft is an important element in the easy working of the machine. The three bearings, including the out board bearing of the generator, are constructed in this manner. They are automatically lubricated by an oil pump driven by a worm mounted on the sleeve coupling between the turbine and generator, which lifts the oil into a tank, from which it circulates into all the bearings under pressure. From the bearings

occupied by the corresponding drums, so that the thrust can be accurately balanced under all variations of load. By this construction the shaft has a very slight residual end thrust, which is taken up with an ordinary thrust bearing.

The steam cylinder has a by-pass valve, which, when open, admits live steam direct to the second or intermediate section of the cylinder. This may be used to increase the capacity of the machine when a heavy overload, up to 60 per cent., is to be carried, or it may be used to develop full power in case the condenser is out of operation, but this increase of power is obtained at the expense of efficiency.

The plant now being described is the first instance of direct connected generators being successfully driven by steam turbines for multiple running, as hitherto the speed of steam turbines has been reduced by gearing or by the use of flexible shafts. The speed regulation of these turbines is excellent, and is accomplished without the least stress, jerk or strain upon the machinery.

#### The Governor.

The governor of the turbine is a very interesting feature. It is of the flyball type, and acts by intermittently cutting off the steam supply entirely for a longer or shorter period, according to the amount of the load. Lever and shaft connections from an eccentric, driven by a worm on the main shaft, operate a small piston valve which controls the larger main admission valve,

which is also of the piston type. The lever is constantly oscillated at a given frequency by the worm gear, which also drives the governor. The small piston valve admits steam above and below the piston, which in turn operates the large piston valve in the main steam supply end of the turbine. At full load the valve is open most of the time, and at very light loads it is closed most of the time. At intermediate loads it is intermittently opened and closed, corresponding with the oscillations of the small piston valve. The frequency of oscillations is 150 per minute for turbines of 500 horse-power. The governors are extremely sensitive and may be adjusted to run within a small fraction of 1 per cent. variation between no load and full load, but as these generators have to run in multiple it was desirable to have a considerably greater variation, that each generator might carry its proper share of the load. The speed of the turbines and the inertia of the rotating part are so great, while the friction is so small, that the turbine will continue running for 20 minutes after steam is shut off. Under these conditions change of speed during one revo-

"C" induction motors, varying from 5 to 100 horse-power, have been installed in the various departments of the works, the majority of them being fastened overhead upon the pillars of the buildings, where they occupy no valuable space, the power being applied through lines of shafting to which the motors are connected by pulleys. These motors have been substituted for steam engines which formerly supplied power, as the whole of the works are now electrically operated. Auto-starting panels are attached to each motor instead of the usual auto-starters. Lighting is provided by inclosed arc lamps of 1200 candle-power, supplied by the Manhattan Construction Company, Newark, N. J. Current for these lamps is reduced by transformers from 440 volts as generated to 110 volts. Two 100 horse-power type "C" motors are being erected in the power station for operating air compressors.

#### Tests.

The turbines have been subjected to elaborate tests, resulting in the very remarkable curves of efficiency

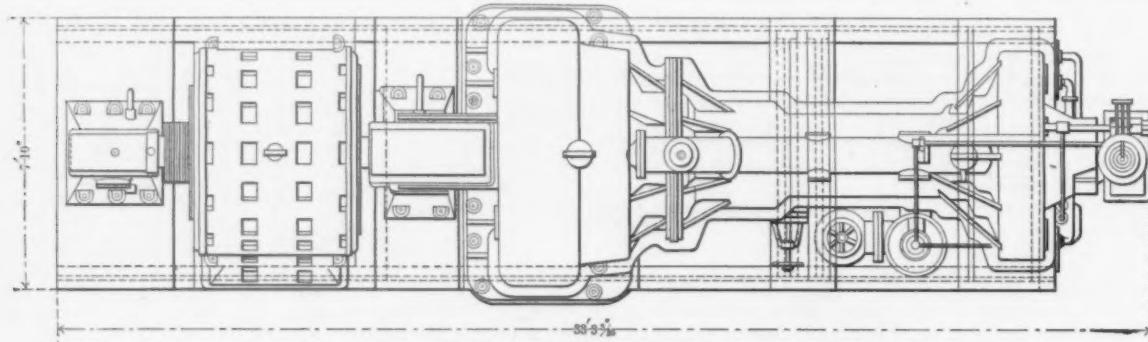


Fig. 4.—Plan 2500 Horse-Power Turbine.

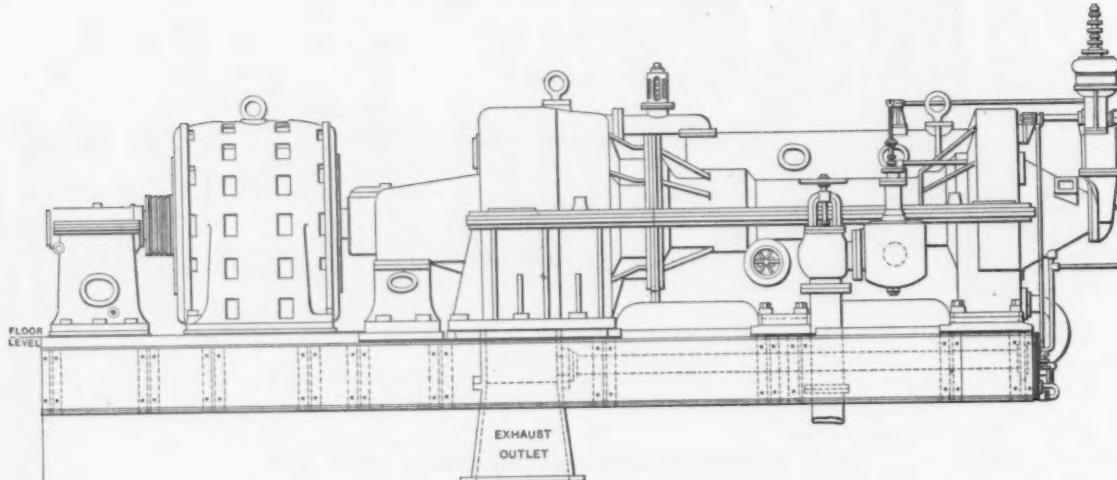


Fig. 5.—Elevation 2500 Horse-Power Turbine.

#### THE WESTINGHOUSE-PARSONS STEAM TURBINES.

lution is reduced to a minimum. There is an adjustment upon the governor for varying the speed within wide limits while the turbines are running, which enables the generators to be brought into synchronism, and the loads divided with the greatest ease.

##### The Generators.

The generators are bi-polar, working at 3600 revolutions per minute, giving a two-phase alternating current of 440 volts at 7200 alternations per minute, each having a capacity of 300 kw. The small size and simple construction of these generators strike the observer, but are explained by the high speed. The generators have four collectors. The switchboard of nine panels follows the usual Westinghouse practice, having one panel for the exciters, three for the generators, a load panel, one feeder panel for light, and three feeder panels for power. On the back of the board are two sets of bus bars, providing for throwing the power circuits on one set and the light circuits on the other set separately, or the two together. The wires are carried in a tunnel below the floor and underground to the various departments of the works, where they are placed overhead, duly insulated from the beams. Several Westinghouse type

shown by the diagram, Fig. 7. The long horizontal portion of the curve of steam, per electrical horse-power, showing a very slight increase of steam consumption per horse-power as the load is reduced, which is notably different from the curve obtained from the highest grades of reciprocating engines of many times this capacity. The following table shows the economy of steam at several loads:

Full load	16.4	pounds steam per electrical horse-power per hour.
$\frac{3}{4}$ -load	17	pounds steam per electrical horse-power per hour.
$\frac{1}{2}$ -load	18.2	pounds steam per electrical horse-power per hour.
$\frac{1}{4}$ -load	22	pounds steam per electrical horse-power per hour.
Running light	750	pounds steam per hour.

It should be noted that the figures of efficiency given above are based upon the electrical horse-power hour. It is impossible to measure the indicated horse-power as ordinarily understood, but it is estimated that the turbines are at full load working on what is the equivalent of 13.2 pounds of steam per indicated horse-power per hour.

These turbines were designed for giving their best results when running condensing, hence the comparatively inferior results, as shown in the economy curves, when running non-condensing. Turbines can be de-

signed for operating non-condensing which would give good results. The effect of opening the by-pass valve is also shown on the curve diagram.

#### A 2500 Horse-Power Turbine.

A larger turbine than those described above is now approaching completion at the works of the company. It will be installed in New York as an addition to the plant of the United Electric Light & Power Company, which recently consolidated with the Edison Company and others, under the control of the Consolidated Gas Company. This will be the largest unit for electrical work ever built either in this country or in Europe, being rated at 2500 horse-power, with an ultimate capacity of 3000 horse-power, to run at 1200 revolutions per minute under a steam pressure of 150 pounds, and will deliver 60 cycle current from a 6-pole generator rated at 1500 kw. The shaft of this machine, complete with its spider and guide blades, weighs 28,000 pounds. The largest diameter of its moving part is 6 feet, and in spite of being able to generate as much as 3000 horse-power, it is a small machine for such a capacity. Views of this turbine are shown in Figs. 4, 5 and 6.

Greater progress in building turbines has hitherto been made in Europe than in this country. We hear of two of the Parsons type, each of 1400 horse-power capacity, being constructed for an electrical plant in Germany, these being the largest yet attempted by the English makers. Steam turbines of smaller size are in use in several central stations and traction plants in England. The latest triumph in naval engineering is H. M. S. "Viper" of the British navy, a torpedo boat destroyer, which has attained a speed of 40 miles an hour, being operated by Parsons' steam turbines. This is the greatest speed which has yet been attained in water, and in addition it has developed greater horse-power from a given amount of fuel than reciprocating engines can afford. The success of this boat, which is much larger than its predecessor, the "Turbinia," has already led to a project for building a steamer with turbines to run between England and France, and engineers are dis-

consideration of the ore to be carried for the Carnegie Company in vessels owned by the Rockefeller interests.

The six new steamships building for the Carnegie Company are all under construction by the American Ship Building Company. Two of the vessels are being built at the Lorain works of the company, three at the Chicago yard, and one at the Detroit plant. Each of these steamships is 474 feet in length over all, 50 feet beam and 28½ feet depth. They are fitted with quadruple expansion engines of 1950 horse-power, with cylinders 18, 26½, 41 and 63 inches in diameter and 42 inches stroke, to which steam is supplied from Babcock & Wilcox water tube boilers. The vessels each cost about \$340,000 and each will have a carrying capacity on a single trip of 7300 tons of iron ore. One or two of the vessels will, it is expected, be ready for service by the opening of navigation and the others will follow with sufficient rapidity to bring the entire fleet into commission by August 1.

The Carnegie Company now use annually about 4,000,000 tons of iron ore, and fully two-thirds of this is handled at Conneaut, Ohio. The Carnegie Company operate the only docks at this port, which, Andrew Carnegie has predicted, will one day be the greatest ore unloading port in the world. The company have four distinct docks, a water frontage of over 5000 feet, and sufficient machinery to unload 20,000 tons of ore from lake vessels in a single day. Here is located the initial automatic ore unloader of the recently invented Hulett pattern, and here two other machines of similar character are now in course of erection. The Conneaut plant represents an investment of several million dollars, and more than 1000 men are regularly employed throughout the season of navigation.

The Pittsburgh, Bessemer & Lake Erie Railroad, over which the ore is transported from Conneaut to the Carnegie plants in the vicinity of Pittsburgh, operates a total of 227 miles of track. The entire line is laid with 100 pound steel rails, the maximum grades are 30 feet to the mile and 80 per cent. of the line is straight track. Fifty-one locomotives and 2708 cars are in use. Thirteen

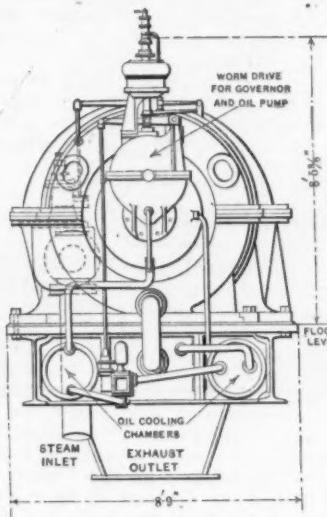


Fig. 6.—End Elevation Fig. 5.

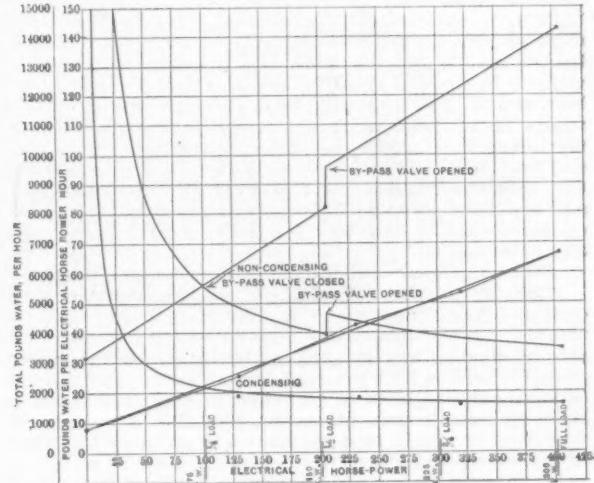


Fig. 7.—Efficiency Curves of 500 Horse-Power Turbine.

#### THE WESTINGHOUSE-PARSONS STEAM TURBINES.

cussing the feasibility of turbine engines for battle ships, cruisers and ocean liners.

#### The Carnegie Company's Ore Transportation Interests.

The ore carrying fleet on the great lakes controlled by the Carnegie Company will consist during the season of 1900 of upward of 15 vessels, which will be capable of carrying during the season about 1,250,000 tons of ore. There is, first, the fleet of six new steel steamships now building and which will have an aggregate carrying capacity during the season of fully 500,000 tons; next, the fleet acquired through the Lake Superior Iron Company, which can take care of an equal amount; and in addition are the steamers "C. A. Black," "Linn," and "Carrington," each of which will be good for from 100,000 to 150,000 tons during the season. Then it is understood that the fleet controlled by the American Steel & Wire Company has also contracted to handle fully 700,000 tons of Carnegie ore. All this is without

hundred of the cars on the line are of the 50-ton steel hopper type. There are also 600 steel gondolas, the capacity of which is 40 tons each. The siding facilities at Conneaut enable from 350 to 500 cars to be handled daily.

The *Labor Gazette* of the British Board of Trade for March publishes an article which states that the number of workpeople reported as killed in the United Kingdom during 1899 by industrial accident was 4416, or 418 more than in 1898. The highest death rate in 1899 was among seamen, where it amounted to 798 out of every 100,000 employed. Among miners the rate per 100,000 was 144 for underground workers, and 78 for surface workers; among quarrymen it was 87, and among railway servants 103. In the case of factory operatives, the death rate was 18 per 100,000. The number of persons reported as injured during 1899 was 96,028. Taking the whole of the industries dealt with, the number reported as injured in 1899 is 16,159 more than in 1898, 32,123 more than in 1897, and 38,556 more than in 1896.

## Washington News.

WASHINGTON, D. C., April 10, 1900.—The House Committee on Naval Affairs has reported the annual appropriation bill and at the same time has removed the seal of secrecy from the testimony taken by the committee during the formulation of the bill, which includes some very interesting statements by the Secretary of the Navy, bureau chiefs and naval constructors. In addition to an exhaustive analysis of the armor plate problem these statements include a discussion of the relative cost of ship construction by the Government and by private shipyards.

In the testimony taken before the committee during the formulation of the bill Admiral O'Neill, Chief of the Ordnance Bureau, made a most interesting statement concerning the practicability as well as the advisability of the construction of a Government armor plant. He said, in part, as follows:

"I do not think that it is expedient for the Government to undertake the manufacture of armor for several reasons, which I will state, though I do not regard it as an impracticable undertaking. There are already in the United States two establishments fully equipped for the manufacture of armor, having adequate facilities to meet the probable requirements of the Government, possessing the expert knowledge and experience, and having at their disposal a skilled force of workmen. At least one of these establishments was induced to take up the manufacture of armor at the solicitation of the Navy Department, and both concerns have invested large sums of money for plant for making armor which is of but little value for any other purpose; and to willfully destroy this branch of their business by the creation of a Government factory seems unnecessary and unjust. Practice and precedent are generally good guides, and the fact that nearly all the maritime nations to-day which build armored ships of war procure the armor therefor from private works is strong presumptive evidence that such a course is preferable to undertaking the manufacture at Government works. Take, for example, Great Britain, with her enormous and continuous shipbuilding programme. Nothing would seem easier or more natural than for the British Government to establish a factory and make its own armor, if any benefit were to be derived from so doing. Instead of doing so, however, it buys its armor from three private manufacturers at a considerably higher price than is paid by the Government, and urged them to increase their output and keeps them full of orders. No one will question the fact that the English are a thoroughly practical people and are likely to be as fully alive to the necessity of exercising economy in the construction of naval vessels as any other nation."

After stating a number of objections he proceeded:

"So far as the difficulty of making armor is concerned, I do not apprehend any great or insurmountable trouble. In my opinion the Government could make armor as good as any private establishment, but it would probably be at a high price, at first at least. The amount of highly skilled labor in an armor factory is believed to be rather small than otherwise, and the percentage of first-class or highly paid mechanics is probably less than at the Naval Gun Factory, much of the labor at an armor factory being of low order. Competent superintendents of the casting, forging, cementing and tempering departments would be necessary, and a first-class metallurgical chemist and an expert steel maker, but there probably would be no great difficulty in finding suitable men to fill these positions at reasonable rates of pay. For the machine shop, power plant, &c., any number of men may be obtained for current wages. I think the difficulties of making armor plate are overestimated, as also are the losses in manufacture. Very few plates fail at the proving ground, and I have no reason to suppose that excessive losses occur at the works, except perhaps at first when new processes are taken up, which naturally have to be developed and perfected at considerable expense."

During the consideration of the bill the committee gave a hearing to Naval Constructor Francis T. Bowles, who gave the advantages and disadvantages of the construction of war ships in Government navy yards. He presented the whole subject very impartially, concluding as follows:

"The last disadvantage I want to lay before you is a very important one, and that is that in building ships in the navy yard you have no guaranty of the performance of the ship when she is completed, whereas a contractor must guarantee a certain amount of performance. That is, he guarantees the horse-power or speed, and he guarantees that the ship shall be strong and that she shall fulfill the different requirements of performance of the specifications, and he is responsible. He has bondsmen."

W. L. C.

## New Merchant Mill at Duquesne.

The Carnegie Company of Pittsburgh are going rapidly forward in the matter of enlarging present plants and building new ones, and within the last few days have decided to put up a new merchant mill at the Duquesne Steel Works, at Duquesne, Pa., which, it is stated, will be the largest of its kind in the United States. It will be recalled that the Carnegie Company have had under construction at Duquesne for some time a new open hearth plant to contain 14 50-ton furnaces and a very large blooming mill, and more recently a billet mill to roll billets down to 1½ inches square was started. These improvements will cost \$3,000,000 to \$4,000,000, and will be supplemented by the building of a merchant mill which will cost \$1,000,000 or more. The object in building this mill is to enable the Carnegie Company to compete for the trade of large agricultural implement concerns like the McCormick Harvesting Machine Company of Chicago, the Deering Harvester Company and other concerns making agricultural implements on a large scale.

The new merchant mill will be built just adjacent to the small billet mill and the material used will be open hearth steel. The building will be 150 x 600 feet in size, and there will also be a large boiler house and other subsidiary buildings. The plant is to be erected on the Athletic Park property, near Oliver Station, and it is probable that it will occupy the corner of the ground skirted by East Duquesne and Oliver avenues, and immediately back of Oliver Station. Contracts for some of the machinery and other necessary apparatus for the mills have already been let. The principal product of the new plant will, of course, be bars and small agricultural shapes ranging from ¼ to 2 inches. The plant will add hundreds of men to the working forces of the Duquesne works. Construction on the new open hearth and blooming mills at Duquesne has been pushed forward at such a rate that it is expected that both may be completed by September 1, which is two months ahead of the time originally estimated. New blacksmith and boiler shops have been completed and the structural work on the machine shop is finished. The first electric travelling crane for the blooming mill has been delivered on the work and the crane supports have been installed. Foundations for the soaking pit extension have been completed and the building which is to be constructed over this work has been started. One of the soaking pits of the old mill is being replaced by a new one.

## Southern Industrial Convention.

The second semi-annual session of the Southern Industrial Convention will be held at the Auditorium, Chattanooga, Tenn., May 15 to 18. An attractive programme of this convention has been issued. This shows that addresses will be delivered by Col. A. K. McClure, editor of the *Philadelphia Times*, on "The Press of the South and Its Relation to the Future of the South;" by Hon. James Wilson, Secretary of Agriculture, on "The Agricultural Interests of the South;" by Hon. H. H. Hargrave, Shreveport, La., on "A Textile University for the South—to be Established by the United States Government;" by Col. J. G. Garrett of New York City on "An Exposition of Southern Products and Resources to be Established in New York;" by Hon. J. A. Van Hoos of Birmingham, Ala., on "The Warrior Canal—a Waterway from Birmingham to the Gulf," and by Alexander Helper of Baltimore on "Railroads and Their Relation to the Industrial Progress of the South."

Discussions will be held on the following subjects: "The Poor White Boys of the South," which will be opened by Clark Howell of the *Atlanta Constitution*; "The Export Trade of the South," which will be discussed by representatives selected by the commercial bodies of New Orleans, Mobile, Pensacola, Savannah and Charleston; "Compulsory Arbitration the Remedy for Strikes, &c.," which will be opened by C. F. Huillen of Louisville; "The Race Problem and Its Relation to the Industrial Development of the South," which will be opened by Dr. W. T. Cole, Waco, Texas, and Dr. Hall B. Barringer, chairman of the faculty of the University of Virginia, Charlottesville, Va.; "The Coastwise Trade of the South, How It May Be Advanced," by a delegation from the Trades League of Philadelphia; "A Ship Canal Across Florida," which will be discussed by delegates appointed by the commercial bodies of the Gulf States.

It is believed that the public sentiment of the South can better be concentrated on any matter of value to that section through this convention than otherwise. The moral effect of such an assembly as this promises to be is expected to prove of the highest service to the future industrial progress of the South. Invitations are not be-

ing sent to a limited number of persons, but cover all business organizations in the South, the members of the press, publishers, governors, superintendents of education, mayors and all others interested in the aims and objects of the convention. It will be held under the auspices of the Chattanooga Chamber of Commerce. H. S. Chamberlain is chairman of the special reception committee.

#### Lucas & Gliem Horizontal Tool Room Boring Machine.

The new boring machine made by Lucas & Gliem of Ridge avenue and Hamilton street, Philadelphia, is sometimes made with a feed to the table for milling, which then makes it a combined horizontal boring, drilling and milling machine. The machine is principally designed for tool room work, but many classes of boring, milling or

#### Mahoning and Shenango Valley Notes.

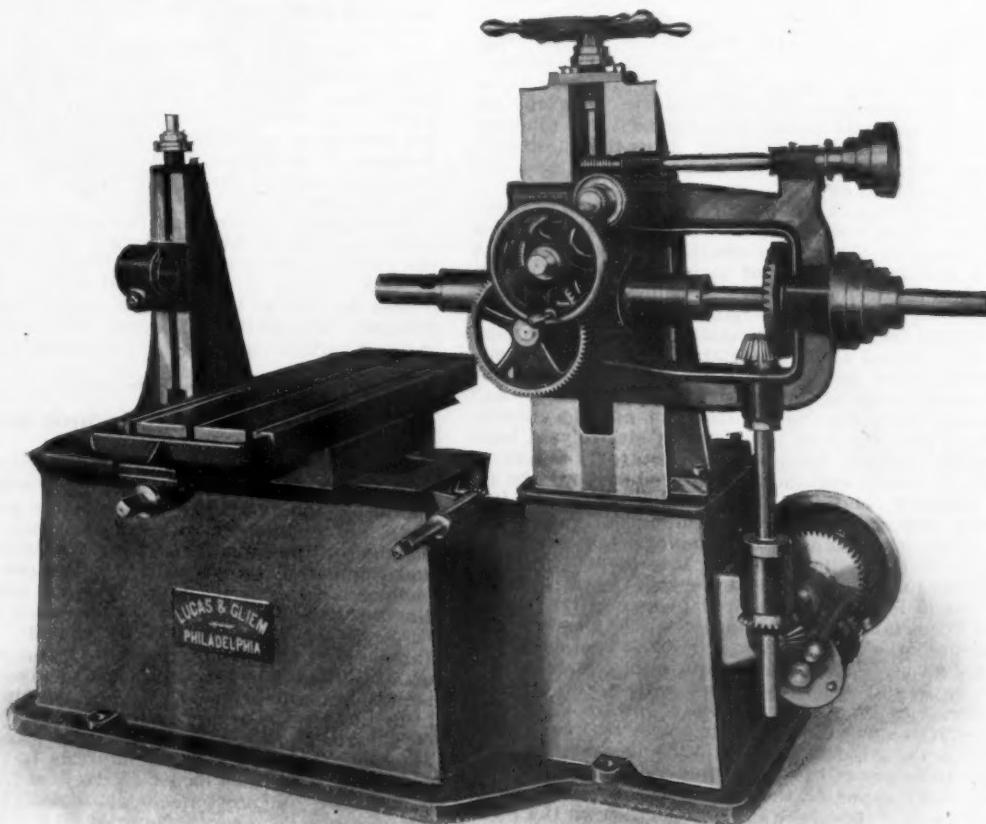
George R. Shickler of Pittsburgh will erect 120 houses in South Sharon, Pa., the location of the Sharon Steel Company's new mills and furnaces. The cost of each house will be about \$1300 and the total cost will be \$153,000.

The Republic Iron & Steel Company have erected a new crusher and made other improvements at their Croton Limestone quarries at New Castle, Pa.

The Sharon Steel Company have purchased a location for their new tin plate works. There are 180 acres in one of the farms and the price paid is said to have been about \$200 per acre.

It is stated that the Trumbull Mfg. Company will build new machine works at Warren, Ohio, to replace the plant destroyed by fire recently. The new works will be completed by August 1.

At New Castle the Stevens Gas Improvement Com-



LUCAS & GLIEM HORIZONTAL TOOL ROOM BORING MACHINE.

drilling can be done on the machine within its capacity. The spindle is 2 inches in diameter through the rack sleeve, and has an automatic feed of 16 inches, with four changes, and a rapid hand movement in either direction. The head carrying the spindle has a vertical adjustment of 16 inches. The work table is 16 inches wide and 36 inches long between the pockets, and has an adjustment of 18 inches at right angles to the spindle and 18 inches parallel with the spindle. The outside support for the boring bar can be easily removed when drilling in the end of long pieces. The adjustments are provided with micrometer reading to thousandths.

In his annual address delivered to the East Indian Council Lord Curzon, Viceroy of India, said that the loss to the wheat crop in that country caused by the drought during the present year was \$40,000,000 to \$50,000,000. He added that the loss to the cotton crop was \$35,000,000, while the oil seed crop, usually covering 18,000,000 acres, was non-existent outside of Bengal and the northwest provinces. The loss to cultivators in Bombay alone in food crops was \$25,000,000, and in cotton \$20,000,000. The Viceroy remarked that it was impossible for any Government to anticipate the consequences of a visitation of nature on so gigantic and ruinous a scale.

pany were recently chartered for the purpose of building gas plants under the process patented by Levi Stevens of Trenton, N. J. By a test made August 2 and 3, 1890, by F. T. Aschman & Co., analytical and consulting chemists, of Pittsburgh there was a production of 51,866 cubic feet of gas per ton of coal used. The company had an experimental plant at Trenton, and are now having a test plant installed in the power house of the New Castle Traction Company, who will use the gas thus produced for a large gas engine which they expect to install soon. The recent rise in coal prices in Western Pennsylvania has set the electric light and power companies to figuring on the cost of running their plants by gas engines. If the Stevens process will do even one-half or one-third as much as its promoters claim for it, it is easy to see that it is a great step in advance.

The Oil City Traction Company of Oil City, Pa., are having excellent satisfaction in running their electric railway by means of Oil City gas engines.

What was probably the longest train on record was hauled recently over the Cleveland & Pittsburgh line. When the caboose was attached in the freight yards the engine was at a station one and a third miles away. The brakeman telegraphed to the engineer at the station, 6000 feet away, to go ahead when the train was ready.

## Canadian News.

### Works at the Sault.

F. H. Clergue, president of the Sault Ste. Marie Pulp Company, and the active spirit in the big corporation which has been formed to build nickel steel works and other industries at the Sault, addressed the Toronto Board of Trade on the 2d inst., giving a sketch of the growth of the enterprises he has to do with in that new Ontario town. He showed, first, how, backed by the strongest financial support, he developed the water power for which the Sault is famous, and how next the pulp mill, the largest of its kind in the world, was hitched to the power plant. Now a sulphite fiber mill of great capacity is nearly finished. As an accessory to this mill Mr. Clergue then wanted a plant for the recovery of sulphur from the ores of Algoma. All, or nearly all, of these ores are sulphides, and it was the belief of Mr. Clergue that sulphurous acid could be obtained from them at less than through the use of imported sulphur. After many experiments in the laboratory, a method of treating the ore so as to save the sulphur was devised. But then the sulphur was the element of least value in the ferro-nickel and copper-nickel ores in which it occurred. Of course the metallic constituents of the ore could not be thrown aside as waste after it had rendered what should be a mere by-product. Thus the question of erecting works for the manufacture of nickel and iron became a practical one.

After extracting the sulphur the experimenters found a residue of iron and nickel in a natural state of union so advantageous that when smelted and reduced to a metal it produced an alloy of almost unequalled utility. That led to the ferro-nickel works being projected. Another process was hit upon—namely, for the separation of the copper from the ore in which it is commonly associated with nickel and iron. But this was not the end of the cumulative development. To refine the nickel and copper constituents of the ore sodium was needed. Salt was brought from the wells at Goderich and the chlorine gas driven off from it as the result of electrolysis, leaving sodium behind. Chemical works are therefore to be built in which sodium will be produced for the refining industry and the chlorine will be turned into bleaching powder. Also, as the sulphurous fumes produced in the manufacture of ferro-nickel far exceed the requirements of the nickel works, it is proposed to turn the surplus into sulphuric acid for sale.

Ore lands have been acquired to supply the works. Besides important nickel claims, the Clergue interests have secured the Helen hematite iron deposit in Michipicoton district. Fifteen or sixteen million dollars, Mr. Clergue says, will be spent in constructive operations by the interests he represents. Already upward of \$2,000,000 have been spent on the water power and pulp mills. A railway, the Algoma Central, is being constructed to put the industries at the Sault into connection with the sources of raw material, the pulp wood and the minerals of Algoma. This line is to run due north from the Sault to join the Canadian Pacific Railway at Missinable, and, as now projected, it is to be pushed through the great spruce belt to Hudson's Bay. A short branch is to run from the main line through the iron deposit to the harbor at Michipicoton, and a considerable section of that branch is already built. A subsidy of \$3200 per mile has been given by the Dominion Government to part of the line, and will doubtless be extended to other parts as soon as the company are prepared to build these. A grant of 6400 acres per mile is being sought from the Ontario Government, and there seems to be practical unanimity in the Legislature in favor of giving some land grant, though possibly not so large a one.

In regard to ferro-nickel produced by the electrochemical treatment to be applied in the Sault works, Mr. Clergue explained that in the ferro-nickel pig as first turned out there would be 7 per cent. of nickel, or about twice the percentage required in nickel-steel. This meant that the mixture had to be diluted with iron until the proportion of nickel present was brought down to 3½ per cent. It was to get a source of iron that is free from nickel that explorations were undertaken which ended in the discovery of the Helen hematite mine. The company cannot use all the ore it will be profitable to produce daily from this mine. They will use 500 tons per day and dispose of the rest in the ore market, some portion of the output being already engaged for the iron furnace at Midland. A hearty vote of thanks was given to Mr. Clergue for giving the Board of Trade so full an account of the industrial possibilities and actualities of New Ontario.

### Proposed Shipbuilding Works for Halifax.

Samuel C. Brookfield of Halifax is interesting a number of Canadian and American capitalists in a project for establishing in that city large steel shipbuilding

works. It is reported that leading members of the Dominion Iron & Steel Company have been approached with a view of enlisting their financial interest in the enterprise. To them the undertaking is expected to commend itself as an additional opening for the consumption of iron and steel produced at their Sydney works. The scheme has not yet been reduced to definite terms, but the amount mentioned as the probable capital of the company to be organized is \$20,000,000.

Nova Scotia has never been reconciled to the loss of the great shipbuilding industry that once flourished in its numerous ports, an industry which received its death blow when iron and steel took the place of wood as the chief material of vessel construction. Of late years the question of starting a great steel shipbuilding industry at some point in the Province has been agitated, and among the places making the strongest claims are Sydney, Halifax and Dartmouth, just across the harbor from Halifax. A steel shipbuilding plant in that part of Canada is certain to be a development of the near future—a sequence of the iron and steel industries that are rising on both sides of Sydney harbor.

### Minor Notes.

The general condition of the iron trade in Canada has been under discussion the last few days in Montreal, where a conference of the iron and nail manufacturers has been going on. Among those present are J. Hendry, Toronto; J. H. Hanna, C. A. Birge, H. C. Birge, Hamilton; C. E. Dewey, Stratford; W. H. Thorne and J. Pender, St. John, N. B.

The Ontario Government has confirmed the agreement with the Ontario Niagara Power Company, permitting the latter to develop power at Niagara Falls.

At a meeting of the Montreal Rolling Mills Company it was decided to increase the capital from \$500,000 to \$750,000. The additional capital will be spent in enlarging and further equipping the company's buildings.

C. A. G. J.

## American Casting Machine Company.

Application has been made for a charter for the American Casting Machine Company of Pittsburgh, with a capital of \$500,000. The incorporators are Julian Kennedy, the well-known consulting engineer; James Scott, manager of the Lucy furnaces of the Carnegie Company, and Edmund W. Heyl of Heyl & Patterson, contracting engineers. Julian Kennedy is to be president, James Gayley vice-president, W. J. Patterson secretary and C. W. Heyl treasurer. These officials, together with James Scott and Walter Lyon, will comprise the Board of Directors. The new concern will absorb the Uehling method for conveying and casting metals, which is controlled by the Carnegie interests; the Davies Casting Machine Company of Warren, Ohio, the Pittsburgh Casting Machine Company, and the interests in several patents for casting machines owned by Heyl & Patterson, Pittsburgh. The company will control some 25 patents on casting machines. The best features of all will be used and the machines will be built by Heyl & Patterson, at 51 and 53 Water street, Pittsburgh, where the company's offices will be located.

The machine to be made by the company casts pig iron in iron molds, instead of in beds of sand, at a saving, it is claimed, of 15 cents per ton. Each machine has a capacity of from 1200 to 1500 tons of pig iron every ten hours. Some of the largest iron plants in the country are now using such machines.

The suit started against Heyl & Patterson and the Cambria Steel Company of Johnstown by the Carnegie Steel Company, Limited, for an alleged infringement on a patent for a casting machine, will, as a result of the consolidation, be discontinued.

## Classification of Charcoal Tin Plates.

We are advised that the American Tin Plate Company have decided to classify their product of bright charcoal plates, according to quality, under five grades, as follows:

American A, equal to "Allaway;" American AA, between "Allaway" and "Melyn;" American AAA, equal to "Melyn;" American AAAA, equal to "Calland;" American AAAAA, superior to "Calland," with a sixth grade, denominated "Premier," representing the finest charcoal plates manufactured. Charcoal plates made at all the company's mills are to be branded on the box accordingly. Thus consumers, in buying, will know precisely what quality of plate they are getting. This arrangement will, it is expected, obviate the confusion often arising by reason of the multiplicity of brands of charcoal plates now on the market, and will make things simpler and easier for both jobbers and consumers.

**The Moore Pneumatic Motor and Chain and Geared Hoists.**

The Moore pneumatic motor, manufactured by the Chisholm & Moore Mfg. Company of Cleveland, Ohio, consists of two double oscillating cylinders set at right

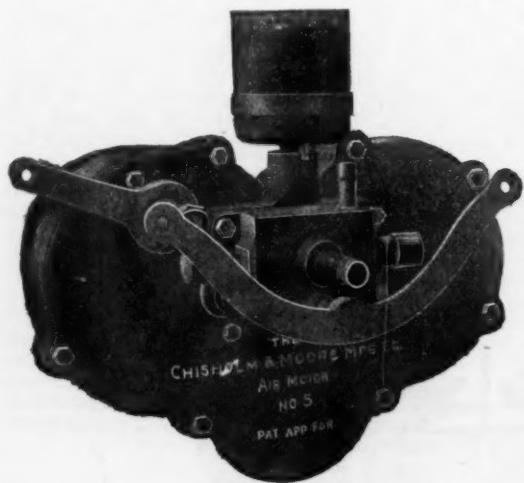


Fig. 1.

*The Moore Pneumatic Motor.*

angles in an air tight case. There is no movable valve mechanism, as the oscillation of the cylinders opens and closes the ports. A small quantity of oil is kept in the case so that the crank in revolving lubricates itself and dashes the oil on the valve seats from which the air carries it through the inlet ports in sufficient quantity to

**Pneumatic Differential Chain Hoist.**

In the chain hoist, Fig. 3, the motor handles the load through differential gearing. The load is so sustained at all points that it cannot settle by leakage of air. It is not dependent upon the air supply for its support. The speed is graduated at the will of the operator, and the height of lift may be increased at will. The valve is operated by two cords reaching to within 5 feet of the ground, and the motor may be instantly stopped, started or reversed. The valve is self closing when the cords are released.

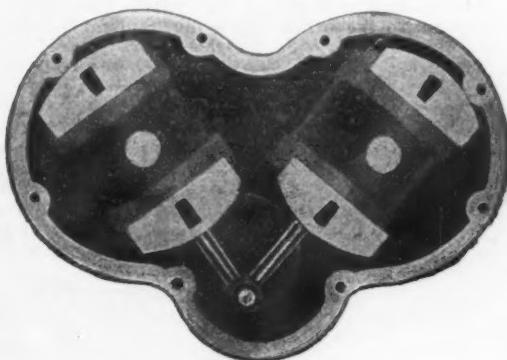
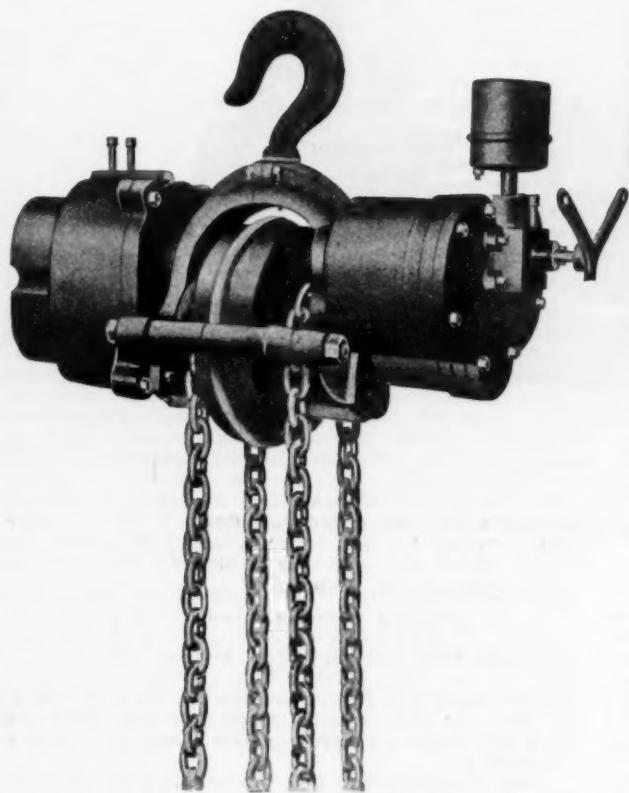
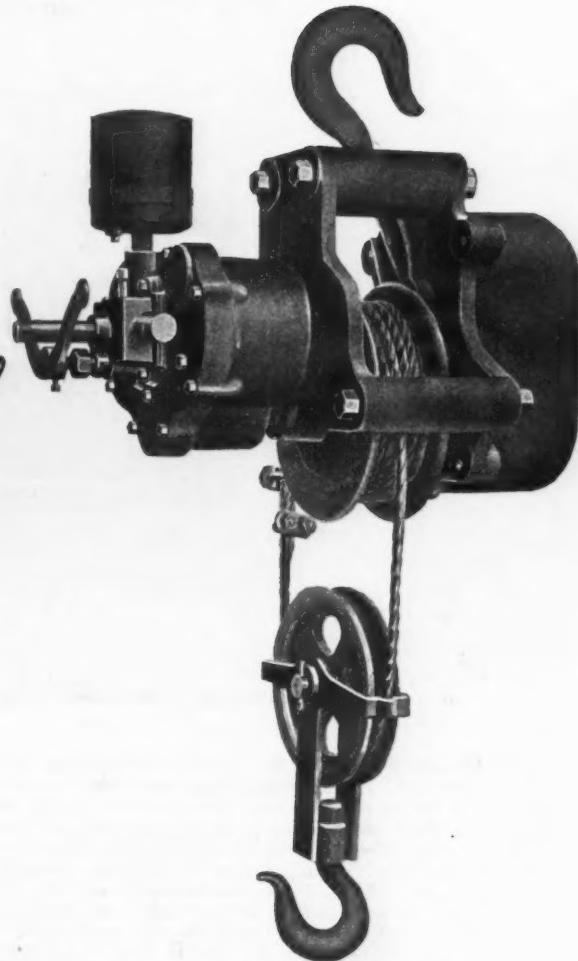


Fig. 2.

Fig. 3.—*The Moore Pneumatic Differential Chain Hoist.*

thoroughly lubricate the pistons. The air ports are controlled by a slide valve which closes them when on a center and starts or reverses the motor as it may be turned to the right or left. The valve is thrown by an eccentric which is mounted on a shaft actuated by a lever; when the lever is released the valve is self closing. It has also a vent valve which enables the operator to lower the load without the consumption of air.

Fig. 4.—*The Moore Pneumatic Geared Hoist.*

**Pneumatic Geared Hoist.**

In the hoist shown in Fig. 4 the motor handles the load through straight line gearing. The load is sustained safely, and cannot settle by leakage of air. The valve is operated by two cords reaching to within 5 feet of the ground, and the motor may be instantly started, stopped or reversed. The hoist is made with a winding drum

and wire rope, and when equipped with double or triple sheaves will handle heavy loads. The height of lift may be increased as desired.

#### The Newton Combination Cold Saw Cutting Off Machine.

In the cold saw cutting off machine here illustrated the spindle is driven by an electric motor through spur gearing, with worm and worm wheel for the power. The head of the machine, which is gibbed to the bed, is fed forward with a screw which is operated through a friction disk and roller; this varies the feed from one extreme to the other. This mechanism is controlled by

#### Pacific Coast News.

SAN FRANCISCO, CAL., April 2, 1900.—The Interstate Commerce Commissioners have now been on this coast for the past two weeks, listening to complaints of various descriptions, incidentally gathering information for future legislation on transportation, and though last, not least, hearing the Pacific Coast side of the great case of the Middle West against the transportation companies.

On March 21 they listened to the complaint of the Phoenix shippers, in which Los Angeles was really defendant. San Bernardino, too, has an old complaint against the southern city, and this was ventilated, as far as the taking of additional evidence is concerned, at a special session of the Commission. The grievance here

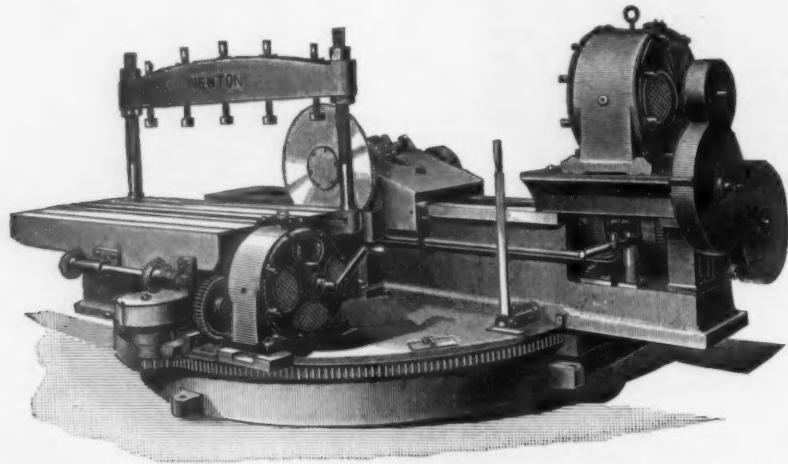


Fig. 1.

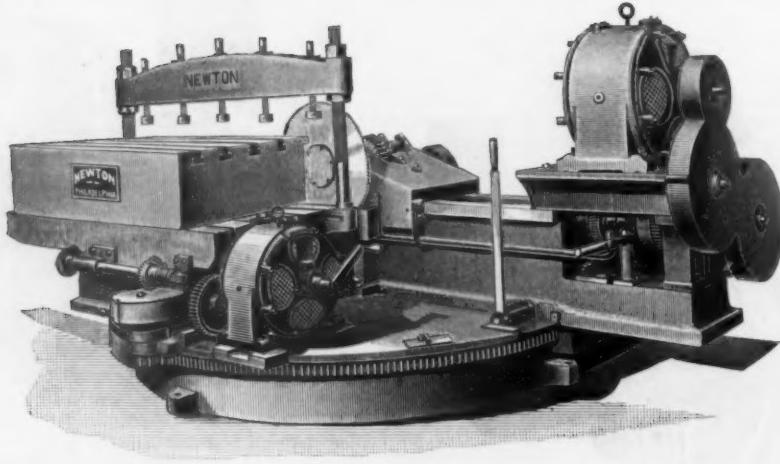


Fig. 2.

#### THE NEWTON COMBINATION COLD SAW CUTTING OFF MACHINE.

a lever, allowing the feed to be instantly changed from the slowest to the fastest feed. The clutch that operates the feed is keyed to the screw, and can be thrown into the worm wheel for feeding, and by operating the lever in the opposite direction the clutch is disengaged from the feed and the friction clutch for quickly returning the head. The tables of the machine are set low, and have a cross adjustment for setting the work true after it is clamped. On top of this table is the auxiliary table, Fig. 2, for use where long work is to be cut. If for direct cutting, the beam or material to be cut is clamped on the lower table, allowing the saw to be fed directly in to the work. The material can be clamped either on the front or rear side of the table, or the top table can be entirely removed if necessary, as shown in Fig. 1.

The illustration, Fig. 3, shows a beam being cut off at an angle of 45 degrees, cutting it in the center of the beam. This machine is built in four sizes, having a maximum capacity for the different sized machines for 10, 15, 20 and 24 inch beams, by the Newton Machine Tool Works of Philadelphia.

is that through rates to Los Angeles are first charged and then arbitrary rates from Los Angeles to San Bernardino. The Commission met on the 27th and heard evidence from several large jobbers, all of whom testified that the partial or total abolition of the differentials would still further restrict the trade of this city or drive the merchants to shipping by sea. They could now send goods not more than 300 miles east despite the differentials.

The Commissioners met this morning in the United States Court room in the Appraiser's Building in this city. There was a good attendance on the part of city jobbers, representing the hardware and metal trades, the grocery business, &c. Among them I may mention Messrs. Baker, Hamilton and Rulofson of Baker & Hamilton; Chas. F. Tay of Geo. H. Tay & Co., Hayden and Carrigan of the Dunham, Carrigan & Hayden Company; Holbrook and Wheeler of Holbrook, Merrill & Stetson; E. A. Selfridge of the Geo. W. Gibbs and J. A. Scott of Miller, Sloss & Scott. Charles Holbrook and A. C. Rulofson gave testimony for the defendants in the

case—that is, the railroads, and incidentally the jobbers of the whole Pacific Coast.

Mr. Holbrook was in the witness chair from 11 a.m. to 1 p.m. He gave a brief historical sketch of his house and of its dealings with transportation companies. When the railroads put the screws on in 1891 the merchants chartered a steamship line and a line of sailing vessels round the Horn, and a rate war commenced. This war lasted two years, at the end of which time the roads made concessions to the shippers and the war was terminated. He did not favor rate wars, as they inflicted injury on all concerned. He gave data as to the respective proportions of the freight that his house shipped by rail and by water. It varied all the way from 22 per cent. to 60 per cent., the balance being rail. The rail freight was the most valuable. Among the articles shipped by water were iron pipe and tin plate. The more costly articles came by rail. The coast cities should have lower rates, as having competition by sea. Lessening differentials would not benefit any one except the Middle West jobbers. The retailer would not get his goods any cheaper. The Middle West jobber would not reduce prices any. All that he wanted was the trade. In fact, if the differentials could be done away with the Middle West jobber could charge what he liked and prices would advance. His house shipped about 85 per cent. of water freight via Panama and the rest via Cape Horn. In answer to questions by the Commissioners he stated that his house was not engaged in any combination to advance prices and denied there was any association of

of the advance in cost. There was an advance everywhere as well as on this coast. As to price-lists it was the custom in the hardware trade for the manufacturers to issue price-lists, whereas in the article of screws, for instance, the numerous sizes would have the prices affixed, and then there were lists of discounts issued according to the changes made by the manufacturers, but there were no lists made by any association representing jobbers.

He thought that the railroads had erred in putting rates up, but that there would have to be a change in this respect and that the principle of patronizing the Cape Horn route, which his house, among others, followed, would bring the railroads in line. When the Philippine insurrection was over the time would come. Already there were four vessels of 15,000 tons' carrying capacity each being prepared for this route, and their agents had been round in the city soliciting freight. The "Irrawaddy" was now being loaded at Philadelphia. She had 4000 tons of freight for which the railroads asked 50 cents, but for which the shippers had obtained a 35-cent rate round Cape Horn, and he had known of as low a rate as 20 cents being made. There were some articles on which there were no differentials. One was shelf hardware. Here three or four hand saws could be shipped at the same rate as 1000. This was not right. The railroads should recognize the wholesale shipper. Rates out of San Francisco were three to four times those to it. When the rate war was in progress and merchants were getting a 25-cent rate round the Horn, the

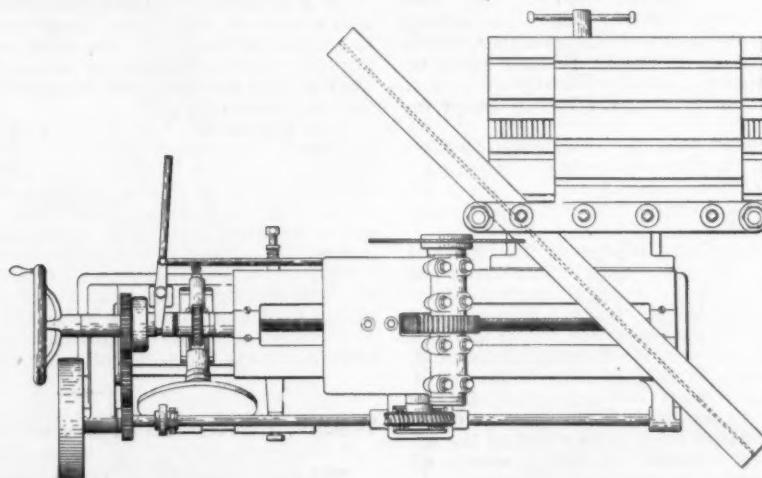


Fig. 3.—Cutting Beam at an Angle of 45°, Machine without Motor.

#### THE NEWTON COMBINATION COLD SAW CUTTING OFF MACHINE.

jobbers established for the purpose. Pacific Coast jobbers had two purchasing markets and two methods of transportation. The Middle West jobber was not satisfied with the trade that he possessed. He had it 1700 miles west and then wanted the other 300 miles where the Pacific Coast jobber now sold his goods. The Coast jobbers had established themselves and built up the country and planted schools and churches and they should have consideration. The Middle West did more trade with the Pacific Coast now than it had ever done. The Middle West manufacturers did not want the present system of differentials disturbed nor did they want graded rates. They were satisfied with matters as they stood. If the system was changed, the Middle West would sell less here and the Atlantic States more.

Mr. Rulofson testified that he had been buyer and transportation agent for his house since 1872 and was thoroughly acquainted with the question at issue in its various phases. If the differentials were abolished or largely reduced, his house would have recourse to transportation by sea. The advance of rates following the increase of differentials did not result in an advance of prices in all cases. The coarser and heavier goods were shipped by sea, and as marine insurance was high and as freights by sea were high owing to the disturbance in tonnage brought about by the war with Spain and the insurrection in the Philippines there was an advance here in some instances, but not in the case of the higher class goods shipped by rail, and where the freight rate did not bear so heavily on the cost. In fact, the Pacific Coast jobber was prompt to reduce but slow to advance. The complaint of a retailer at Los Angeles as to the advance in prices was unfair. There was an advance in all goods in this line and in most other lines on account

railroads cut under and made a 22½-cent rate from St. Louis, besides beating on time. Mr. Rulofson was still under examination when your correspondent left the court room. The members of the Board present were Martin A. Knapp, Judson C. Clements, Jas. D. Yeomans and Joseph W. Fifer. The coast jobbers were represented by E. S. Pillsbury, the Middle West men by H. L. Christie, attorney for the St. Louis Business Men's League; the Southern Pacific by W. F. Herrin, and the Santa Fe by G. W. Sterry.

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#### Largest Naval Appropriation Ever Recommended.

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At Washington, on the 5th inst., the Naval Appropriation bill was reported to the House by Acting Chairman Foss of the Naval Committee. The amount carried by the bill is \$61,219,916, the largest ever reported to the House from the Naval Committee. Aside from this the report which accompanies the bill is remarkable for its presentation of facts regarding sea power the world over, foreign naval programmes, and the comparative strength of the navies of the great maritime powers, and is accompanied by colored charts showing the upbuilding of the various great navies. The report is, in part, as follows:

"For the purpose of further increasing the naval establishment of the United States the committee recommend that the President be authorized to have built by contract two sea going coastline battle ships carrying the heaviest armor and most powerful ordnance for vessels of their class upon a trial displacement of about

13,500 tons, and to have the highest practicable speed and great radius of action, and to cost, exclusive of armor and armament, not exceeding \$3,600,000 each; three armored cruisers of about 13,000 tons trial displacement, carrying the heaviest armor and most powerful ordnance for vessels of their class, and to have the highest practicable speed and great radius of action, and to cost, exclusive of armor and armament, not exceeding \$4,250,000 each, and three protected cruisers of about 8000 tons trial displacement, carrying the most powerful ordnance for vessels of their class, and to have the highest speed compatible with good cruising qualities and great radius of action, and to cost exclusive of armament not exceeding \$2,800,000 each."

Continuing, the report says: "The maximum cost of the ships herein authorized, exclusive of armor and armament, will be \$28,350,000. This is the largest naval programme ever submitted by the Committee on Naval Affairs of the House, and is in accord with the wishes and recommendations of the Secretary of the Navy and Admiral Dewey, and will, we believe, meet the just demands of public sentiment."

The report tells of the futile efforts to secure armor plate at \$300 and \$400, and says: "The battle ships 'Maine,' 'Ohio' and 'Missouri,' now in process of construction, require 7,359.42 tons of armor, or 2453.14 for each vessel. It is believed by the committee that these battle ships, of nearly 13,000 tons displacement, the largest in design which have ever been planned by the Navy Department, should have the best obtainable armor, and accordingly your committee recommend that the Secretary of the Navy be authorized to contract for such armor at a cost not to exceed \$545 per ton. The best obtainable armor at the present time is, according to all naval authorities, the so-called Krupp armor, which is at least, and has been so proved by ballistic tests, of 25 per cent. greater efficiency than the Harveyized armor. Every nation in the world is using the Krupp armor to-day."

It is also recommended that the restriction to \$300 per ton for the armor of the three battle ships, "Georgia," "Pennsylvania" and "New Jersey," and the three armored cruisers, "West Virginia," "Nebraska" and "California," be removed.

One of the most interesting features of the report is that which discusses "our naval policy." It gives the gradual upbuilding of the new navy, year by year, under Secretaries Chandler, Whitney, Tracy, Herbert and Long, and says: "We have a navy to-day which includes a considerable number of vessels of every class, and, ship for ship, it will equal that of any navy in the world. Let us build as we have been building—gradually, on broad lines, and upon the most advanced ideas of naval construction; not so fast that we will be ahead of the advance of naval progress, but slow enough to secure all the benefits of new improvements and new inventions; or, better still, to do as the American Navy has always done, when given an opportunity, lead the march of the best naval construction."

The report further says, as to public works: "Under the head of public works is that of the completion of the dry docks which are now being built at Portsmouth, Boston, League Island, Mare Island and the floating dock at Algiers, La., requiring an appropriation of \$1,550,000." The bill also provides for the beginning of construction of two more stone dry docks, one at New York and the other at Norfolk, Va. At the present time there is no dock at either place large enough to take in the largest battle ship with safety.

Four members of the minority of the Naval Affairs Committee, Messrs. Wheeler of Kentucky, Rixey of Virginia, Kitchen of North Carolina, and Vandiver of Missouri united in a report opposing certain items of the Naval Appropriation bill. Their report dwells especially upon the failure of the majority to make provision for a future supply of armor plate at a reasonable cost.

#### Employment for Technical Graduates.

Referring to the editorial on the above subject which was printed in *The Iron Age* for March 29, the following statement has been received from a professor of mechanical engineering connected with one of our leading Western universities:

"I suppose that many of the things which it says are true when extended all over the United States, but in my own case I have found that the demand for our graduates of the technical departments has for the last few years exceeded our ability to supply. I have had all this year five or six places waiting for some one to fill, and I cannot agree with all of the ideas which the editorial brings out. However, our point of view is limited and we probably do not know what the conditions are when extended over a large territory. My own experience during the last 15 years as a teacher of mechanical

engineering has been that all of the graduates from the department with which I have been connected have been able to easily secure positions. This has extended through the somewhat hard times which have recently departed. During the last six years about 50 men have graduated from this department, and 48 of these 50 are now engaged in lucrative mechanical pursuits."

#### Wind Mill Exports.

The U. S. Wind Engine & Pump Company of Batavia, Ill., have received a contract for the supply of what is claimed to be the largest wind mill ever shipped from this country to foreign parts. The contract calls for a Halladay geared wind mill 40 feet in diameter, which will be utilized for driving a flour mill situated at the foot of the Atlas Mountains in Algeria. There will also be a pumping outfit, consisting of an 8-inch pump, to have a capacity of pumping 1200 gallons per hour. A steel tank capable of holding 7000 gallons of water will also be supplied. The surplus water will be used for irrigation purposes. The value of the contract is said to be \$7500.

The company have recently shipped a 13-foot pumping mill and a 40-foot steel tower to be erected on the grounds of an insane asylum, a missionary institution at the foot of Mount Lebanon 4 or 5 miles out of Beyrouth, Syria. The Khedive of Egypt has lately been shipped an 18-foot standard pumping wind mill, to be mounted on an angle steel tower 80 feet high. This equipment, which is intended for the San Stefano summer palace near Alexandria, will furnish power for lifting water into a tank 40 feet above the ground and 80 feet above the water in the well. The outfit has a 5 x 12 inch improved double acting Curtis pump, having a capacity of 4000 gallons per hour, which amount is required for use in the palace and grounds.

The Government of Victoria was forwarded about the same time two large wind mill and tank outfits for pumping water on the Australian Central Railway. The wind mills are 24 feet in diameter, while the tanks have a capacity of 12,000 gallons each. Two 13-foot standard wind mills have been shipped to South Africa just before the outbreak of hostilities. They are for an ostrich farm near Graaf-Reinet, Cape Colony. These outfits will elevate water 53 and 56 feet, respectively, supplying sufficient water for irrigating and farm purposes. The company are now figuring on some important Austrian contracts for wind mills to drive electric dynamos.

#### Wilcox, Crittenden & Co.'s Improvement.

Wilcox, Crittenden & Co., manufacturers of marine hardware, Middletown, Conn., several months since commenced installing an electric plant for power and lighting purposes. The plant is now completed and the whole establishment will hereafter be operated entirely by electricity.

Heretofore their works have been run by steam and water, and the scattered condition of the various departments have made it necessary to use rope transmission. This will be entirely dispensed with and instead electric wires are run connecting with motors, one for the machinery department, one for the galvanizing department, one for the forging department and one for the foundry, which is situated quite a distance from the main works. All these motors are connected with a generator which will furnish electricity, not only for power, but for lighting their whole premises.

Their jack shaft is constructed with quill attachment, so that they are enabled to run by water power or by steam only, or both together as formerly, and in the event of a break down of the steam plant and a shortage of water the system can be operated by current supplied by the Electric Light & Power Company of the city, thereby insuring a continuous run, if necessary, under the most unfavorable circumstances.

The main and larger bearings are furnished by the Hyatt Roller Bearing Company of Harrison, N. J., which they figure will save at least 20 per cent. in horse-power developed. The electrical equipment was supplied by contract with the General Electric Company of Schenectady, N. Y. This enterprising company are the first manufacturers in Middletown to adopt electric power.

The proposed Buffalo branch of the Pennsylvania Railroad, which will start at Wilcox, Pa., and follow a route by way of Lafayette and Bradford, Pa., will in one place cross a deep gorge with a steel viaduct 500 feet high. The bridge will be over 3000 feet long and its construction will be a very important engineering feat. It will be the highest bridge in the world, so it is claimed.

### The Tatum Paper Punching Machines.

The paper punching machines made by the Samuel C. Tatum Company of Cincinnati consist of one or more heads, which have detachable connections with the sleeves on the main or eccentric shaft, reaching across from one side to the other of the machine. The throwing of the eccentric actuates the punch, the upper end of which is shown in the second illustration, projecting above the top of the head piece, or punch and die holder. Beside the fact that the heads are readily adjustable to any distance apart on the eccentric shaft, their distinctive features are shown first in the head which carries the punch and die. The punch and die are held in one piece, and in the adjustment of the machine for any particular job no special skill is required, the adjustment or substitution of punches and dies being a simple matter.

These machines are made in two styles. In the foot power punch, Fig. 1, the heads are adjustable for any

A large amount of structural steel is being prepared for shipment by the Pennsylvania Steel Company to Santiago, Cuba, for a railroad and iron pier, now being constructed at a point 30 miles from Santiago. During the month of March the Steelton plant made the heaviest output in its history, and the production for April will be even larger. The conditions at the frog, switch and signal and bridge and construction departments are unchanged. These departments are excessively crowded and new orders are being booked daily. There is still more or less car shortage, but the shipments from these works during the week were very satisfactory. A large force of stone masons are at work at the new machine shop, blast furnaces and merchant mill.

The Middletown plant of the National Tube Company is running in sections, but a fair average output is being made. A large foreign trade is being developed.

The plant of the Lalance-Grosjean Mfg. Company is running steadily on good demand. The chances are that the entire force will be regularly employed during the balance of the year.

Saturday morning the last heat at the muck bar mill of the Central Iron & Steel Company, located at Herr street and the Pennsylvania Railroad, was drawn from the furnaces and the whistle was blown for the last time. The transfer of the old mill property, machinery included, to the Pennsylvania Railroad was made today, and the railroad company will lose no time selling the buildings and machinery for what they will bring, preparatory to the early laying of freight tracks on the site of the old car shops and iron mill. The Herr street mill was built in 1852, and when in full operation turned out about 800 tons of muck bar a month. It was idle from February 1, 1896, until May 15, 1899. It is unlikely that the Central company will construct a new muck bar mill at the main plant; at least, not for the present.

The Harrisburg Pipe & Pipe Bending Company, who bought the buildings of the old Harrisburg Car Com-

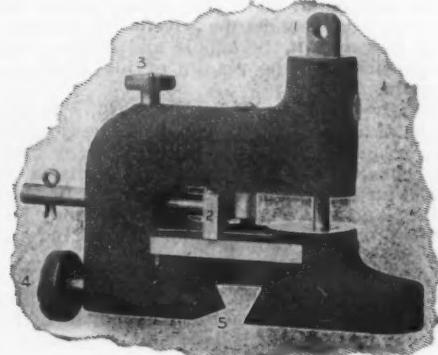
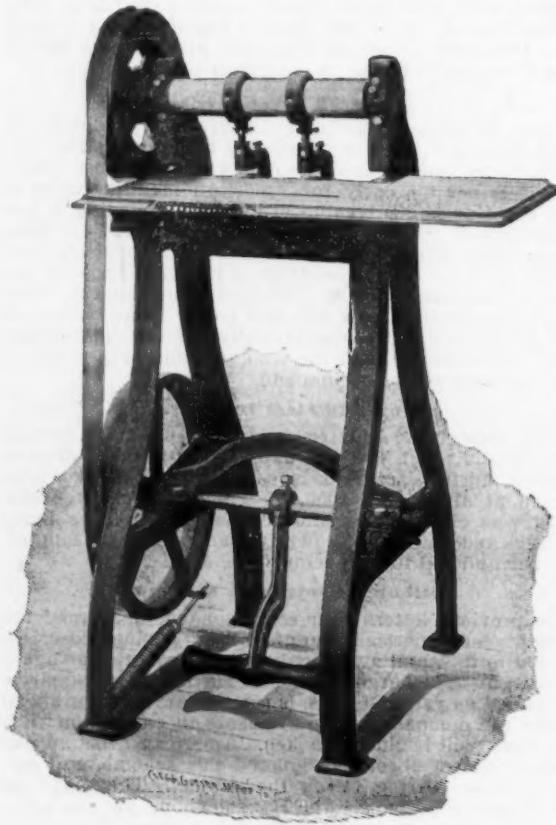


Fig. 2.—Enlarged View of Punch and Die Holder.

#### THE TATUM PAPER PUNCHING MACHINE.

distance from  $1\frac{1}{2}$  to  $11\frac{1}{2}$  inches, center to center of holes, and will punch from one to eight holes at one operation. The uprights are cut back, so as to admit a sheet to the full depth of the punching head. The side gauge, which gives any desired side margin, may be set for either side of the machine. The regular foot power punch will punch from  $1\frac{1}{32}$  to 1 inch diameter. All the punching dies are interchangeable. In the steam power punch the same principle of the head is used. It will punch from  $1\frac{1}{32}$  to 1 inch diameter.

#### Central Pennsylvania News.

HARRISBURG, April 9, 1900.—There has been a slight clearing of the atmosphere in this district, but conditions are not as satisfactory as the iron and steel men had hoped they would be at this period. The deadlock is difficult to break, and it is becoming reasonable to suppose that prices will break before the tie-up is ended. Plate makers are feeling the results of the holding off among the consumers more than any other branch of the trade. So far as the Pennsylvania Steel Company are concerned, however, they are crowded with work, and every department is making an immense output.

Stockholders of the Susquehanna Iron & Steel Company here are pleased with the reduction of the annual dividend from 24 to 12 per cent. They believe that the plant is able to earn a steady dividend at that rate, and that it will hold the stock level in good as well as dull times.

pany, have nearly completed their demolition. The materials of the old car shops have been used in the erection of the new pipe mill, power house and other additions to the pipe company's plant. The pipe mill, 280 x 60 feet, is pretty well completed, and the machinery is being installed and furnace erected. The boilers and engines are being placed in the power house, while foundation work on a socket making shop has been commenced. The pipe company are well stocked with orders, and are employing about 200 men, which force will be materially increased when the new mills are in operation. Among the larger orders booked lately is one from the American Ice Company for about 80,000 feet of coil work for one of their large plants in Baltimore. This contract must be filled within 60 days, and with the other work on hand will keep the plant quite busy for some months. Foreign trade is looking up. A carload shipment of coils was made to Reading, England, on Saturday.

It is expected that all the land along the Pennsylvania Railroad between the Pennsylvania Steel Works and Middletown will be occupied by industrial plants. Should the American Car & Foundry Company close negotiations for the large tract upon which a representative of the company secured an option last week, a good start will have been made in this direction. It is land admirably situated for manufacturing purposes. There would then be an almost continuous belt of industrial concerns from this city eastward 10 miles. The Pennsylvania Railroad Company, west of the city, are being hedged in the same way with manufacturing plants.

## Should a Foundry Chemist Be a Practical Melter as Well?\*

BY DR. EDWARD KIRK.

When visiting foundries in different sections of the country I have learned that but a very small per cent. of them employ chemists, and the reason for not employing them is largely due to the system adopted by the advocates of chemistry in placing the matter before foundrymen.

This has been done upon the theory that it is only necessary for the founder to have an analysis of his irons to enable him to produce castings of any degree of hardness, softness and strength desired, which in many instances has not been the case.

This system seems to me to be entirely wrong, and certainly has been productive of a prejudice against the employment of chemists in foundries. By this system the founder is compelled to make his mixtures from analysis, something in which he is not experienced, and is responsible for results.

The question that many founders have asked is, Why should we employ a chemist, when we have the same work to do and responsibility as without one, and no greater certainty of results?

It is a well established fact that the quality of an iron may be greatly deteriorated when melted in a cupola by improper melting. And the results indicated by analysis may be entirely destroyed in this way, and with the present system of the chemist only furnishing analysis, the science of chemistry is placed entirely at the mercy of the melter, who can destroy its aim at will and who frequently does destroy it, either through ignorance of the proper management of a cupola or prejudice against chemistry.

To relieve the founder of responsibility in making mixtures and make the chemist of greater value to him and also to place the chemist in a position independent of the melter and make him master of his science, I propose that the chemist be given full charge of the mixing of iron and of the cupola and melter, that he be held responsible for the results of his analysis at the cupola spout.

To prepare the chemist for the work, I propose that a course in practical foundry chemistry be established by colleges, giving a course in metallurgy, or by mechanical training schools, that will make the chemist a practical melter and an expert on cupola management, as well as a chemist. And when employed in a foundry he should be given full charge of the cupola and mixing and melting of irons.

I do not propose the chemist be required to do the laborious work of melting, but that he be given full charge of the cupola and melter, with power to discharge the melter if he does not follow his instructions in managing a cupola.

By this system the cost of melting in many foundries could be reduced to a sufficient extent to more than pay the salary of a chemist, more satisfactory melting done and better castings produced.

This would be an inducement to the founders to employ chemists, and more advancement would be made in foundry chemistry in one year than has been made in the past ten years with the present system.

I desire to place this matter before the Foundrymen's Association for their consideration as a practical means of increasing the employment of chemists in foundries.

### Destruction of the Great Dam at Austin.

The great dam across the Colorado River, near Austin, Texas, which was constructed seven years ago at a cost of \$1,000,000, was swept away on the morning of the 7th Inst. by an unprecedented flood in that river. The break caused an instant rise of fully 50 feet in the river below the dam. It is estimated that fully 50 people have met death in the floods. The power house of the municipal water, electric light and power plant, situated immediately below the dam, was destroyed, and the city authorities are paralyzed by the magnitude of the catastrophe. The city is without lights and all electric street cars are inoperative, as the two systems derived their power from the wrecked municipal plant.

The dam was the second largest in the United States. It was 1143 feet long, 60 feet deep and 60 feet across at the base. It formed Lake McDonald, which was 30 miles long and about  $\frac{1}{2}$  mile wide when the water was even with the crest of the dam, but when the accident occurred the water was flowing over the crest to a height of about 10 feet. It had been raining continuously

\* Read at the meeting of the Foundrymen's Association, Philadelphia, April 4.

throughout that part of Texas for 48 hours. The flooded streams have done a great deal of damage over a wide area of country.

### Australian Notes.

#### Steel Rails for New South Wales.

The Barrow Steel Company of England were the successful bidders for a contract for 19,000 tons of steel rails for New South Wales, at the price, after allowing for shipping charges, of £152,727 10s. The lowest tender was that of an American firm, the Illinois Steel Company, at £151,417 10s., but this company, it is said, made certain stipulations with regard to exchange which would have meant more expense, insisting that the New South Wales Government should have a banker's credit, which would have meant commission to some American house. The Tender Board, in accepting the English contract, stated that the exchange and expenses in connection with the Illinois Steel Company's tender would have brought the actual cost to more than that of the English company. The Pennsylvania Steel Company and several British firms were among the unsuccessful bidders.

#### Railway Workshops.

The Queensland Railway Department evidently intend their new workshops, shortly to be erected at Ipswich, to be thoroughly up to date as regards machinery, and it is not too early for American manufacturers to pay the Government polite attention by sending a few catalogues if they have no agent on the spot. A large boiler shop, 300 x 120 feet, is now under construction, and this is to be followed by a machine shop of the same dimensions; then by a large car shop, smithy, paint shop, tinsmith's shop, saw mill and power house, where all the machinery will be electrically driven. The outlay will be a huge one, and the whole scheme will probably take several years to complete.

#### Iron and Steel Imports.

The importations of iron and steel, exclusive of machinery and plant, into the five eastern colonies of Australasia during last year is estimated at 300,000 tons, valued at about £2,500,000, of which a little over one-third was classed as manufactured, the balance being castings and rolled and drawn iron and steel, such as girders, bar and rod iron, fencing wire, &c.

#### Melbourne Sewerage Scheme.

In previous letters your correspondent has urged the necessity of American manufacturers paying closer attention to this, and at the risk of being wearisome again returns to the charge. The scheme is not one-quarter completed as yet, and there is a ten years' market ahead before the demand for requirements in connection with this work will begin to slacken. American firms appear to have almost absolutely ignored this scheme, and certainly want stirring up on the subject. They may be full of orders, but so are the English shops, yet the latter are finding time to attend to the job, and are so building up trade in certain lines that their names are becoming practically household words.

Additional pumping engines will shortly be required, the plant running to about £100,000 in value. There is a constant demand for solid drawn lead traps, plumbers' sundries, certain lines of pumps, general ironmongery, tools, bolts and nuts, wrought and cast iron pipes, hydrants, &c. There is no need to attempt a moral; the demand is steady and America is nowhere to be seen in the trade.

**Large Canadian Foundry Company.**—The Canada Foundry Company, Limited, have been organized with an authorized capital of \$1,000,000, to take over the old St. Lawrence Foundry Company of Toronto. The new company will employ in the neighborhood of 200 men, and the pay roll will, it is said, be from \$75,000 to \$100,000 per annum. The officers and directors are as follows: President, W. D. Matthews, Toronto; vice-president, Frederic Nicholls, Toronto; managing directors: T. W. Horn, Toronto; W. R. Brock, E. B. Osler, M.P., Toronto; Wm. Hendrie, Hamilton; Sir Wm. Van Horne, Montreal; H. S. Holt, Montreal; W. H. Winslow, Chicago; secretary, A. Oakley; superintendent, L. E. Hinkley; chief of sales department, H. J. Hamilton.

C. M. Schwab of Pittsburgh has decided to erect a new building for the manual training school at Homestead. The school was established in 1896. A foundry department has lately been started, and when the new building is completed there will be added a forge department and a school in which girls can be taught cooking and sewing. All the mechanical arts and drawing are taught in the school. The pupils come from the public schools and number 227 boys and 16 girls.

## Shrinkage of Malleable Iron Castings.\*

BY H. O. EVANS.

In the paper by Mr. Davis on "Annealing Malleable Cast Iron," read before this association at its March meeting, the subject of allowance for pattern shrinkage was alluded to. In a critique of that paper written by Dr. Moldenke, and read before the Pittsburgh Foundrymen's Association, he says: "The expansion taking place during anneal is well known, and allowed for in making the patterns. It may be taken, as a general rule, that the contraction of the chilling irons used for 'malleables' is  $\frac{1}{4}$  inch to the foot. In the anneal an expansion of  $\frac{1}{8}$  inch to the foot takes place, the net result being the ordinary contraction allowed for gray iron. Patterns are therefore made in the usual manner, the special art of the 'malleable' pattern maker being shown in the gating, chill arrangements, &c."

Now as the writer was, at the time Mr. Davis' experiments were being made, superintendent of that foundry, he may be pardoned if he uses some of Mr. Davis' figures to controvert the "net result" arrived at by Dr. Moldenke as a guide for the malleable pattern maker. The writer's opinion has been, since he first encountered the problem in 1886, that the pattern shrinkage on malleable castings is the greatest variable known since  $x$ ,  $y$  and  $z$  were first used to denote such a quantity, and in this we are glad to have Dr. Moldenke's support, as when he states "contraction and expansion are not regular," and "long malleable castings can therefore show some unexpected features." The reason for this he ascribes to the following three causes:

1. Changes in chemical composition of the iron; 2, casting temperature; 3, shrinkage in interior. To these the writer would add a fourth—viz., annealing temperature and length of anneal.

On examining these causes, we find that all of them are practically beyond the control of the pattern maker, who is carefully held to drawing dimension, with rule and caliper. In dealing with this question we will do well to divide it into the two natural stages as they occur, as follows:

1. The shrinkage, or, more properly, contraction due to cooling, in the white iron casting.

2. The expansion, the result of annealing.

The composition of the iron we will leave to the chemist; the temperature of casting and chilling arrangements to the foundry foreman.

In the first stage of contraction, the commonly accepted rule is  $\frac{1}{4}$  inch to the foot, and this result is borne out by Table 3 in Mr. Davis' paper, from which I quote as follows:

Size bar.	Pattern length.	White iron. Length.	Annealed. Length.	Contraction.	Expansion.	Net contraction.	Carbon.
$\frac{1}{4} \times 1$ .....	12	11.768	11.882	0.293	0.064	0.168	Extracted
$\frac{1}{4} \times 1$ .....	12	11.784	11.920	0.216	0.148	0.070	average.. 0.103
$\frac{1}{4} \times 1$ .....	12	11.757	11.927	0.249	0.170	0.073	
$\frac{1}{4} \times 1$ .....	12, 125	11.909	12.068	0.216	0.184	0.082	Present
$\frac{1}{4} \times 1$ .....	12	11.742	11.942	0.258	0.900	0.058	average.. 0.042
$\frac{1}{4} \times 1$ .....	12	11.769	11.964	0.231	0.195	0.066	
Averages.....		0.233	0.156	0.076			

In this experiment the patterns were accurately made on a board, four to each set, were drawn without rapping and poured from one ladle, with the exception of the  $\frac{1}{4}$ -inch bars, which were our regular test and poured as usual, being given three days' annealing at a moderate heat. The iron analyzed: Silicon, 0.60; sulphur, 0.047; total carbon, 3.23.

Referring to results, we see that the average contraction, the result of 24 measurements, is within 0.018 of assumed contraction, which is very close, and here would call attention to the fact that the maximum variation from average is only 0.026, the extremes differing only 0.042, showing that for all thicknesses the contraction is very uniform, at least when, as in this experiment, the fractures show complete combination.

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That a "remarkable change" does take place during annealing I agree with Dr. Moldenke, but I differ from him when he says that removal of carbon in the skin is but a small matter, for the fact that we can largely remove it from light sections confirms the view

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For light section,  $\frac{1}{8}$  to 1-16 inch per foot; for heavy sections, above  $\frac{1}{8}$ , 1-16 to 1-32 inch per foot. For cored holes have the print the exact size up to, say, 2 inches in diameter; above, use the same rule as on the rest of the pattern. For a pattern of heavy section that is rapped for drawing make the exact size. The writer has followed this rule on castings 2 feet in length with excellent results. The only positive rule to be given is to try every pattern before going ahead.

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	Tons.	Tons.	Tons.	Tons.
Duluth.....	2,376,064	2,635,262	3,509,965	4,900,000
Two Harbors.....	2,651,465	2,698,245	3,973,738	5,000,000
Escanaba.....	2,302,131	2,808,513	3,720,218	3,900,000
Marquette.....	1,945,519	2,245,965	2,733,596	2,950,000
Ashland.....	2,067,637	2,391,088	2,703,447	2,850,000
Superior.....	531,825	550,403	878,942	2,050,000
Gladstone.....	341,014	385,956	381,457	400,000

Among shippers the Oliver Iron Mining Company are expecting to send down little short of 5,900,000 tons. Of this some 1,750,000 tons will come off the Gogebic range, 1,500,000 off the Mesaba, and 1,250,000 off the Marquette. This will all come from eight old mines, with some small shipments from new properties. The Federal Steel Company will ship 3,700,000 tons out of Minnesota and a small tonnage off other ranges. One of their mines, the Fayal, has contracted to deliver the enormous tonnage of 1,500,000 tons, and is intending to exceed that quantity. The Rockefeller railroad will move from the Mesaba range alone nearly 5,000,000 tons, of which more than 2,000,000 tons will be from their own mines. These three concerns with three others, Corrigan, McKinney & Co. from their own mines, the American Steel & Wire from their own mines and purchased ore, and the National Steel from their own mines, will ship about 73 per cent. of the total output of the lake region for the year.

\* Read before the Foundrymen's Association, Philadelphia, April 4.

## Should a Foundry Chemist Be a Practical Melter as Well?\*

BY DR. EDWARD KIRK.

When visiting foundries in different sections of the country I have learned that but a very small per cent. of them employ chemists, and the reason for not employing them is largely due to the system adopted by the advocates of chemistry in placing the matter before foundrymen.

This has been done upon the theory that it is only necessary for the founder to have an analysis of his irons to enable him to produce castings of any degree of hardness, softness and strength desired, which in many instances has not been the case.

This system seems to me to be entirely wrong, and certainly has been productive of a prejudice against the employment of chemists in foundries. By this system the founder is compelled to make his mixtures from analysis, something in which he is not experienced, and is responsible for results.

The question that many founders have asked is, Why should we employ a chemist, when we have the same work to do and responsibility as without one, and no greater certainty of results?

It is a well established fact that the quality of an iron may be greatly deteriorated when melted in a cupola by improper melting. And the results indicated by analysis may be entirely destroyed in this way, and with the present system of the chemist only furnishing analysis, the science of chemistry is placed entirely at the mercy of the melter, who can destroy its aim at will and who frequently does destroy it, either through ignorance of the proper management of a cupola or prejudice against chemistry.

To relieve the founder of responsibility in making mixtures and make the chemist of greater value to him and also to place the chemist in a position independent of the melter and make him master of his science, I propose that the chemist be given full charge of the mixing of iron and of the cupola and melter, that he be held responsible for the results of his analysis at the cupola spout.

To prepare the chemist for the work, I propose that a course in practical foundry chemistry be established by colleges, giving a course in metallurgy, or by mechanical training schools, that will make the chemist a practical melter and an expert on cupola management, as well as a chemist. And when employed in a foundry he should be given full charge of the cupola and mixing and melting of irons.

I do not propose the chemist be required to do the laborious work of melting, but that he be given full charge of the cupola and melter, with power to discharge the melter if he does not follow his instructions in managing a cupola.

By this system the cost of melting in many foundries could be reduced to a sufficient extent to more than pay the salary of a chemist, more satisfactory melting done and better castings produced.

This would be an inducement to the founders to employ chemists, and more advancement would be made in foundry chemistry in one year than has been made in the past ten years with the present system.

I desire to place this matter before the Foundrymen's Association for their consideration as a practical means of increasing the employment of chemists in foundries.

### Destruction of the Great Dam at Austin.

The great dam across the Colorado River, near Austin, Texas, which was constructed seven years ago at a cost of \$1,000,000, was swept away on the morning of the 7th inst. by an unprecedented flood in that river. The break caused an instant rise of fully 50 feet in the river below the dam. It is estimated that fully 50 people have met death in the floods. The power house of the municipal water, electric light and power plant, situated immediately below the dam, was destroyed, and the city authorities are paralyzed by the magnitude of the catastrophe. The city is without lights and all electric street cars are inoperative, as the two systems derived their power from the wrecked municipal plant.

The dam was the second largest in the United States. It was 1143 feet long, 60 feet deep and 60 feet across at the base. It formed Lake McDonald, which was 30 miles long and about  $\frac{1}{2}$  mile wide when the water was even with the crest of the dam, but when the accident occurred the water was flowing over the crest to a height of about 10 feet. It had been raining continuously

\* Read at the meeting of the Foundrymen's Association, Philadelphia, April 4.

throughout that part of Texas for 48 hours. The flooded streams have done a great deal of damage over a wide area of country.

### Australian Notes.

#### Steel Rails for New South Wales.

The Barrow Steel Company of England were the successful bidders for a contract for 19,000 tons of steel rails for New South Wales, at the price, after allowing for shipping charges, of £152,727 10s. The lowest tender was that of an American firm, the Illinois Steel Company, at £151,417 10s., but this company, it is said, made certain stipulations with regard to exchange which would have meant more expense, insisting that the New South Wales Government should have a banker's credit, which would have meant commission to some American house. The Tender Board, in accepting the English contract, stated that the exchange and expenses in connection with the Illinois Steel Company's tender would have brought the actual cost to more than that of the English company. The Pennsylvania Steel Company and several British firms were among the unsuccessful bidders.

#### Railway Workshops.

The Queensland Railway Department evidently intend their new workshops, shortly to be erected at Ipswich, to be thoroughly up to date as regards machinery, and it is not too early for American manufacturers to pay the Government polite attention by sending a few catalogues if they have no agent on the spot. A large boiler shop, 300 x 120 feet, is now under construction, and this is to be followed by a machine shop of the same dimensions; then by a large car shop, smithy, paint shop, tinsmith's shop, saw mill and power house, where all the machinery will be electrically driven. The outlay will be a huge one, and the whole scheme will probably take several years to complete.

#### Iron and Steel Imports.

The importations of iron and steel, exclusive of machinery and plant, into the five eastern colonies of Australasia during last year is estimated at 300,000 tons, valued at about £2,500,000, of which a little over one-third was classed as manufactured, the balance being castings and rolled and drawn iron and steel, such as girders, bar and rod iron, fencing wire, &c.

#### Melbourne Sewerage Scheme.

In previous letters your correspondent has urged the necessity of American manufacturers paying closer attention to this, and at the risk of being wearisome again returns to the charge. The scheme is not one-quarter completed as yet, and there is a ten years' market ahead before the demand for requirements in connection with this work will begin to slacken. American firms appear to have almost absolutely ignored this scheme, and certainly want stirring up on the subject. They may be full of orders, but so are the English shops, yet the latter are finding time to attend to the job, and are so building up trade in certain lines that their names are becoming practically household words.

Additional pumping engines will shortly be required, the plant running to about £100,000 in value. There is a constant demand for solid drawn lead traps, plumbers' sundries, certain lines of pumps, general ironmongery, tools, bolts and nuts, wrought and cast iron pipes, hydrants, &c. There is no need to attempt a moral; the demand is steady and America is nowhere to be seen in the trade.

**Large Canadian Foundry Company.**—The Canada Foundry Company, Limited, have been organized with an authorized capital of \$1,000,000, to take over the old St. Lawrence Foundry Company of Toronto. The new company will employ in the neighborhood of 200 men, and the pay roll will, it is said, be from \$75,000 to \$100,000 per annum. The officers and directors are as follows: President, W. D. Matthews, Toronto; vice-president, Frederic Nicholls, Toronto; managing directors: T. W. Horn, Toronto; W. R. Brock, E. B. Osler, M.P., Toronto; Wm. Hendrie, Hamilton; Sir Wm. Van Horne, Montreal; H. S. Holt, Montreal; W. H. Winslow, Chicago; secretary, A. Oakley; superintendent, L. E. Hinckley; chief of sales department, H. J. Hamilton.

C. M. Schwab of Pittsburgh has decided to erect a new building for the manual training school at Homestead. The school was established in 1896. A foundry department has lately been started, and when the new building is completed there will be added a forge department and a school in which girls can be taught cooking and sewing. All the mechanical arts and drawing are taught in the school. The pupils come from the public schools and number 227 boys and 16 girls.

## Shrinkage of Malleable Iron Castings.\*

BY H. O. EVANS.

In the paper by Mr. Davis on "Annealing Malleable Cast Iron," read before this association at its March meeting, the subject of allowance for pattern shrinkage was alluded to. In a critique of that paper written by Dr. Moldenke, and read before the Pittsburgh Foundrymen's Association, he says: "The expansion taking place during anneal is well known, and allowed for in making the patterns. It may be taken, as a general rule, that the contraction of the chilling irons used for 'malleables' is  $\frac{1}{4}$  inch to the foot. In the anneal an expansion of  $\frac{1}{8}$  inch to the foot takes place, the net result being the ordinary contraction allowed for gray iron. Patterns are therefore made in the usual manner, the special art of the 'malleable' pattern maker being shown in the gating, chill arrangements, &c."

Now as the writer was, at the time Mr. Davis' experiments were being made, superintendent of that foundry, he may be pardoned if he uses some of Mr. Davis' figures to controvert the "net result" arrived at by Dr. Moldenke as a guide for the malleable pattern maker. The writer's opinion has been, since he first encountered the problem in 1886, that the pattern shrinkage on malleable castings is the greatest variable known since  $x$ ,  $y$  and  $z$  were first used to denote such a quantity, and in this we are glad to have Dr. Moldenke's support, as when he states "contraction and expansion are not regular," and "long malleable castings can therefore show some unexpected features." The reason for this he ascribes to the following three causes:

1. Changes in chemical composition of the iron; 2, casting temperature; 3, shrinkage in interior. To these the writer would add a fourth—viz., annealing temperature and length of anneal.

On examining these causes, we find that all of them are practically beyond the control of the pattern maker, who is carefully held to drawing dimension, with rule and caliper. In dealing with this question we will do well to divide it into the two natural stages as they occur, as follows:

Size bar.	Pattern length.	White iron Length.	Annealed Length.	Contraction.	Expansion.	Net contraction.	Carbon.
$\frac{1}{4} \times 1$ .....	12	11.768	11.892	0.232	0.064	0.168	Extracted
$\frac{1}{4} \times 1$ .....	12	11.784	11.930	0.216	0.146	0.070	average.. 0.103
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Averages.....				0.232	0.156	0.076	

In this experiment the patterns were accurately made on a board, four to each set, were drawn without rapping and poured from one ladle, with the exception of the  $\frac{1}{2}$ -inch bars, which were our regular test and poured as usual, being given three days' annealing at a moderate heat. The iron analyzed: Silicon, 0.60; sulphur, 0.047; total carbon, 3.23.

Referring to results, we see that the average contraction, the result of 24 measurements, is within 0.015 of assumed contraction, which is very close, and here would call attention to the fact that the maximum variation from average is only 0.026, the extremes differing only 0.042, showing that for all thicknesses the contraction is very uniform, at least when, as in this experiment, the fractures show complete combination.

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You will note that at a depth above 3-16 inch the carbon extracted is very little, and shows some basis for the old rule that  $\frac{1}{8}$  inch was the thickest you could get good malleable. Under this division we note in the first class of carbon extracted that the average expansion is 0.126, and in the second class the average carbon present is 0.193, or 50 per cent. more than in the lighter section, and the only assignable reason the writer can submit is that the carbon present as graphitic or temper carbon must cause the castings to assume larger dimensions in the molecular rearrangement which occurs during anneal.

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\* Read before the Foundrymen's Association, Philadelphia, April 4.

Drake, Stratton & Co., who are the largest firm of earth contractors in the Lake Superior region, expect to move about 2,000,000 cubic yards of earth this year from three mines on the Mesaba range. They will take half of this off the Biwabik mine, 900,000 yards from the Fayal, and 150,000 from the Auburn. For this work the firm will operate nine great steam shovels, numerous locomotives and about 900 men. At the Biwabik their work will be to take off part of the earth lying over ore between the east and west cuts of the mine, making it more easily reached by trains and uncovering many millions of tons of ore. It will be necessary to remove not less than 5,000,000 yards before this work is complete, and it is probable that four years will be required for the entire work. A timber bridge more than half a mile long has been built on which to move the waste dirt, and a tract of 80 acres has been bought for a dumping ground. This is the largest job of stripping ever undertaken in the lake region, and, at present prices, will cost not less than \$2,000,000.

In addition to this vast quantity of earth to be moved by this firm other mining companies and contractors are to move almost as much more. The American Mining Company will strip several hundred thousand yards at their Sauntry and Alpena mine, the Colonial Mining Company are stripping about 100,000 yards from the Hale mine, the Mahoning Ore & Steel Company will increase their stripped area by a large amount, the Stevenson and possibly some others will be opened for shovel mining. As to some of these no determination has been made of the amount of earth to be removed, but it will necessarily be large.

The types made me say last week that the Fay mine, an interest in which had been bought by Pickands, Mather & Co., held, so far as now known, only 1000 tons of ore. This was too small by three ciphers. It is supposed to contain far more than 1,000,000 tons, but developments to date have not been extensive enough to show it. The high price paid for this lease of 30 and 35 cents a ton is largely on account of the small phosphorus content of the ore, running from 0.020 down, and is another indication of the fact that ores in the ground are hereafter to be bought on a basis of quality rather than quantity, or rather that quality will be more of a determining factor than ever. The experience of Mesaba mining companies in recent sales has impressed this fact quite sharply.

Adams mine, of the Consolidated Company, will have five shafts in commission by next month, and has on surface now more than 200,000 tons of ore. It is intended to make very heavy shipments from the mine this year; in fact a very large output not only for this season but for a number of years to come has been sold at such prices as will lead the buyers to demand every ton. A number of heavy consumers in the Central West are congratulating themselves on their contracts for Adams ore at a price that does not cover the costs of freight and royalty as they stand to-day. One of the Crowe mechanical stokers, described in *The Iron Age* a few weeks ago, has been installed at No. 2 boiler house of this mine.

P. L. Kimberley, who is opening the Spruce mine, expects to mine this year 150,000 tons therefrom. This from a mine where as yet not one foot of underground work has been done, except for a shaft 50 feet into ore, would be impossible elsewhere, and is an interesting comment on the rapidity of development possible on this range. Negotiations for the sale of this mine to another concern than the National Steel are in progress. A lease has been made of the old Cincinnati mine, adjoining the Biwabik, to J. G. Tener of Pittsburgh. The mine never was properly opened, and is in such shape that much work will be necessary to place it in good condition. Capt. R. P. James and a party of miners from Iron Mountain, Mich., have this week arrived at Hibbing to open the Macgregor mine of the Dessa Company there. This will be one of the new shippers for the season off this range.

John T. Jones of Iron Mountain, who has been active in explorations of the Menominee range, said to your correspondent this week that a surprisingly large percentage of the work there had proved disappointing, and that the range seemed to present many features, so far as its explorations are concerned, similar to the Vermillion. Still, a large tonnage of new ore has been opened into, and they are frequently reporting promising finds.

A significant fact is the announcement that the Dunn mine, which has been the largest shipper in the Crystal Falls section and was the mine in which F. Schlesinger got his start, is to be reopened by the sinking of a new shaft 800 or more feet deep. Two years ago the workings caved in and are entirely wrecked, so that a new mine will be opened.

Cuff of the American Mining Company is to be a good shipper this year, and a new and larger hoisting

plant is going in. The Oliver Iron Mining Company have found a body of ore near their Gibson, at Amasa, that promises well. It is a soft Bessemer ore. The Ely Exploration Company have taken the old Groveland mine and propose to develop it and adjoining lands that have shown a body of ore. The Groveland itself was started as a concentrating proposition, but was a failure in 1891, though much money was spent there.

It is reported that ore has been found about 17 miles northwest from Escanaba, in neighborhood where there are no mines. Explorations will be made there at once.

At the Brotherton, or Stegmiller, at Swanzy, taken by the American Mining Company, they are sinking in the old shaft and framing a shaft house. Much interest is taken in the location and those surrounding it. Work on a new shaft at the Mitchell, belonging to Jones & Laughlins, is started and will be pushed vigorously. At the Beaufort, Michigan, hoisting has started.

It is expected the Copper Range Railroad will be extended south to a connection with the Chicago & Northwestern, through a tract of hard wood land that is to be utilized for charcoal and other purposes.

A large number of options for mineral leases have lately been filed on lands along the Vermillion range. On this range the Mahoning Ore & Steel Company are reported to have found an excellent showing of ore.

D. E. W.

## THE WEEK.

A Cleveland dispatch states that the American Shipbuilding Company are contemplating the construction of two large dry docks at Buffalo, N. Y., to cost about \$400,000.

Officials of the Philadelphia Commercial Museum are in San Francisco, Cal., assisting in the establishment of a similar institution in that city to be named the Pacific Commercial Museum, started with the object of attracting Oriental trade to the Western States.

United States Minister Bryan writes from Petropolis, Brazil, to the State Department, that the president of the San Francisco Railroad, in the State of Bahia, Dr. Argolla, is inclined to make an experiment with 5000 tons of American bituminous coal, to be followed by further orders if the trial proves satisfactory. Dr. Argolla, who is a graduate of the Troy Polytechnic School, is desirous of promoting United States trade in Brazil. He believes that structural shapes and steel rails would find an extensive market. He asks for catalogues and price-lists of iron manufacturers.

A member of the French Aero Club has offered a prize of \$20,000 for an international competition to solve the balloon steering problem. The winner must start from the club's inclosure at Longchamp, sail around the Eiffel Tower, and return to the inclosure, traveling altogether a distance of nearly 7 miles inside half an hour. The prize must be won within five years.

The exploring steamer "Southern Cross," bearing C. E. Borchgrevink and the survivors of the South Polar expedition, fitted out in 1898 by Sir George Newnes of London, arrived safely at Wellington, New Zealand. Mr. Borchgrevink reports that he has located the magnetic pole and, further, that he reached the most southern point ever recorded by Antarctic explorers.

The German Emperor is said to have offered a prize of \$20,000 for the best automobile war carriage, which is to combine all the requisites for service in the field.

One of the largest belts for machinery that has ever been produced was recently completed by the Gutta Percha & Rubber Company of Toronto, Canada, for the grain elevator of the Intercolonial Railway at St. John, N. B., and is now in use there. The belt is of rubber and measures 3529 feet in length, or over 2-3 mile. It weighs 9 tons.

The first "trust" has just been formed in Japan by the combination of about 200 cotton spinners. They say the business has become so large that combination and co-operation are necessary in order properly to compete with American yarns and cotton goods.

April 21 is mentioned as the date on which the New York State canals are to be opened, which is an earlier date than usual.

United States Consul-General Mosley, at Singapore, Straits Settlements, writes to the State Department suggesting the desirability of introducing the rubber tree into the Southern States. The climate, soil and moisture in the southern parts of Georgia, Alabama, Mississippi, Louisiana and Texas, the consul believes, will admit of the cultivation of the rubber tree and the production of profitable India rubber crops.

# The Iron Age

New York, Thursday, April 12, 1900.

DAVID WILLIAMS COMPANY,	- - - - -	PUBLISHERS.
CHARLES KIRCHHOFF,	- - - - -	EDITOR.
GEO. W. COPE,	- - - - -	ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS,	- - - - -	HARDWARE EDITOR.
JOHN S. KING,	- - - - -	BUSINESS MANAGER.

## The Iron Age Paris Library.

American manufacturers of hardware, machinery and other iron and steel products who have not yet availed themselves of the opportunity to be represented in *The Iron Age* Paris Library are urged to do so immediately. All that is necessary is to send one copy of their latest catalogues or circulars to the office of *The Iron Age*, 232 to 238 William street, New York, marked "For the Paris Library." No expense is involved to the sender in any way. The catalogue or other publication, when received, will be forwarded to Paris and become a part of this important American contribution to the exposition. If manufacturers will send their catalogues promptly they will be received in time to be entered in the catalogue of the library, which will shortly be printed, and will then be widely distributed in foreign countries.

## Changed Business Conditions.

Few things in commercial history are more interesting than the passing of a type of successful business men, who only a score of years ago were leaders of thought and action in the world of affairs. Strenuous, hard headed, often close fisted, shrewd, masterful, and with a deep substratum of common sense, they lived only for their work and its final success. They had but little time and less inclination for the calls of pleasure and the allurements of travel and the arts.

To-day there attaches to them the curious interest of a bygone period, for they mark the end of the old and the beginning of the new era. To the extent that they mingle in business affairs of any great moment they are a detriment rather than a help. Their very tenacity of opinion and resoluteness of determination render them a stumbling block because they fail to realize the changed conditions which have done away with the old ways and the old methods. Nothing marks this change more than the merging of individualism into co-operation. It has finally come home to all but the most impenetrable that standing out alone means merely a continuance of that relentless and unnatural competition that can have only one end.

In the consolidations of the past year it was almost pathetic to see the grim determination with which some of the old fashioned units held out to the last, reluctant to lose their identity and to surrender a firm name that represented the toil and thought of their lives. It was hard for them to realize that the law of economics considers the interests of the many, often at the expense of the individual.

Another notable change is the widening of the field of thought and experience. It does not require much experience to demonstrate that extended and lasting success can only be had on the basis of a broad and liberal policy. It does not pay to be small and exacting. It is a mistake to indulge in sharp practice and deception. It is short sighted to take unfair advantages.

This does not mean that the business world is a rose water affair, governed only by sentiments of the highest

honor, or that talented unscrupulousness does not often achieve success, but it does mean that the basis of all continued successful business dealings is that of mutual confidence, and that deception and sharp practice can result only in distrust and retaliation. Commerce in its most complex as in its most simple form is a thing of barter, a matter of give and take. No agreement can have lasting value that is not fair to all parties.

Most notable, again, is the spirit of harmony and conciliation. It is being widely recognized that, save as a matter of principle may be involved, there are few misunderstandings worth arguing, much less quarreling about. Diplomacy was once defined as "the art of knowing when to make concessions." It is felt that it is better to be good natured often than to stand upon trifles. It is wiser to be yielding at times than to arouse feeling. The fact of being imposed upon occasionally or of being "worked" does not alter the general truth of this attitude. In the round up of results the "chronic kickers" do not fare so well as those who have pleasanter ways of attaining their purpose.

The mere existence of so many large concerns is in itself a proof of the value and necessity of harmony among their members. Among the many qualities demanded of the heads of such organizations none is so requisite as that of minimizing and keeping down internal discords. There can be no success without this internal harmony, and the concern in which all pull together have but little to fear from outside pressure.

## Increase in Copper Production of the World.

Henry R. Merton & Co., Limited, of London have issued their annual table showing the copper production of the world. The figures show the production of each year from 1883 to 1899, inclusive.

From this table we have compiled the following, showing the increase in production made in 1899 over the year previous. The figures are in long tons:

	1899.	1898.	Changes.	Per cent.
Algeria.....	50		Decrease	50 100.0
Argentina.....	65	125	Decrease	60 48.0
Australasia.....	20,750	18,000	Increase	2,750 15.3
Austria-Hungary.....	1,505	1,540	Decrease	35 2.3
Bolivia.....	2,500	2,050	Increase	450 21.9
Canada.....	6,730	8,040	Decrease	1,310 16.3
Chili.....	25,000	24,850	Increase	150 0.6
Cape of Good Hope.....	6,490	7,060	Decrease	570 8.1
England.....	550	640	Decrease	90 14.0
Germany :				
Mansfeld.....	20,785	18,045		
Other German.....	2,675	2,040		
Totals Germany.....	23,460	20,085	Increase	2,375 11.3
Italy.....	3,000	2,965	Increase	35 1.2
Japan.....	27,560	25,175	Increase	2,385 9.5
Mexico :				
Boleo.....	10,335	9,435		
Other Mexican.....	9,000	7,000		
Totals Mexico.....	19,335	16,435	Increase	2,900 17.6
Newfoundland.....	2,700	2,100	Increase	600 28.6
Norway.....	3,610	3,615	Decrease	5 0.1
Peru.....	5,165	3,040	Increase	2,125 69.9
Russia.....	6,000	6,260	Decrease	260 4.1
Sweden.....	520	480	Increase	40 8.3
Spain and Portugal :				
Rio Tinto.....	34,370	33,705		
Tharsis.....	11,000	11,150		
Mason and Barry.....	3,600	3,600		
Sevilla.....	1,200	800		
Other mines.....	3,550	3,120		
Totals Spain and Portugal.....	53,720	52,375	Increase	1,345 2.5
Totals foreign.....	208,660	194,885	Increase	13,775 7.0
United States :				
Calumet and H.....	41,000	40,400		
Other lake.....	28,363	30,062		
Montana.....	106,650	97,400		
Arizona.....	54,793	48,359		
Other States.....	31,400	18,050		
Totals United States.....	262,306	234,271	Increase	27,835 11.0
Grand totals.....	470,866	429,156	Increase	41,710 9.7

It will be noted by the above that the increase of production has not been nearly as great as was anticipated by many recent pessimistic forecasts. The statistical position is strong and healthy, and proves that even the recent tremendous demand and high prices were unable

to open up new properties and add much to the production at short notice.

The most conspicuous increase was made, of course, by the United States with a gain of 27,935 tons. Mexico made the second largest gain with 2900 tons, with several important new developments now under way. The increase of 2750 tons in Australia is closely followed by Germany and Japan. The German increase of 2375 tons was made principally in the Mansfeld district. The advance of Japan stands out more prominently in view of the closing down of the Besshi mine, one of the largest in that country.

#### Canadian Iron and Steel Developments.

After making very slow progress for many years in building up an iron industry, Canada suddenly shows astonishing enterprise. Up to this year the Dominion has been able to boast of but four blast furnaces, two running on coke and two on charcoal, all of them combined having made in 1899 but 90,112 gross tons of pig iron. A couple of small steel plants and several rolling mills for reworking scrap completed the list of producers of iron and steel beyond our northern border. It was not for lack of inducements. The Canadian Government did what it could to foster the industry, going further than the United States in this respect. It offered iron and steel producers bounties for every ton turned out, besides giving them tariff protection against outside manufacturers. In some of the provinces an additional bounty was offered by the Provincial Government, thus making the inducement to build blast furnaces and rolling mills still larger. Nevertheless, discouragingly slow progress was made. Capitalists were afraid to risk the necessary investment. All the known mineral riches of both the Atlantic provinces and the Lake Superior region seemed unable to attract capital as they should. But within a very few months a decided change has occurred. Projects which would be considered large in this country have been seriously undertaken. Contracts for great iron and steel plants have been made at several points, and an excellent beginning in the line of modern development is promised before the end of this year.

Attention has been centered for some time on the movements of the Dominion Iron & Steel Company, of whom H. M. Whitney is president, who are now building works at Sydney, Cape Breton, to convert into steel the rich ores of Newfoundland. The possibilities of this enterprise are quite startling, if the statements made and expectations excited are borne out by the results of actual day by day work. But while this star is rising in the East, another of as great if not greater brilliancy appears in the West, in the form of the Nickel Steel Company of Hamilton, Ontario, who have let contracts for a huge plant to be located on the north shore of Lake Erie, comprising blast furnaces of the Duquesne class and open hearth furnaces of the Homestead exuberance, capable of turning out 2400 tons of steel daily. As if these were not enough to flaunt in the faces of American steel makers, who have hitherto almost owned the Canadian market, another steel plant of considerable proportions is among the probabilities of the remarkable industrial development now being made on the Canadian side of the Sault, between Lake Superior and Lake Huron, under the management of F. H. Clergue. The Canadian Steel Company, another new corporation, to have an authorized capital of \$18,000,000, will operate at Welland, Ontario, at the mouth of the Welland Canal, where 1500 acres have been secured for a site on which

to build blast furnaces and extensive steel works. Further, the old Nova Scotia Steel Company, now running a small blast furnace and open hearth steel works at New Glasgow, Nova Scotia, will probably be expanded into the Nova Scotia Iron & Steel Company, with a capital of \$20,000,000, for the purpose of operating on a much larger scale. Should all these enterprises be pushed to successful and full grown conclusions, Canada will no longer figure among "other countries" in the world's list of iron and steel producers, but will take its place ahead of Sweden and perhaps of Belgium. This is, of course, not a pleasant subject for the contemplation of American manufacturers. It would be much more satisfactory to be without serious competition on this side the Atlantic.

#### The Waste of War.

Among the many confident and congratulatory forecasts of the business outlook we note a cheerful strain of prophecy in certain important lines of manufacturing based on the great destruction of valuable property of one kind or another incident to the war now in progress in South Africa. There seems to be a disposition among makers of mining machinery, agricultural implements, tools and like wares to exchange congratulations because of the replacements which will be found necessary when the war is over. Even British manufacturers and jobbers are rubbing their hands with satisfaction in anticipation of a demand certain to be voluminous and exigent, and which will run their productive facilities to the breaking point for many months after peace is declared. Careful estimates have been made of replacements necessitated by the waste of the war; and should the Boers meet the now certain invasion of their own territory as the Russians met the legions of Napoleon, by burning their cities, as is threatened in the case of Johannesburg, we would perhaps be told that trade would be mightily benefited thereby. The greater the replacement demand the more confidently may it be predicted that the prices easily obtainable by those first in the field will show unusually satisfactory profits.

In business plans there is, perhaps, no room for sentiment. However great the calamity which creates a replacement demand, the practical man of affairs expects to take advantage of it, if what he has to sell, or can control, is thereby made temporarily and artificially scarce. It is the part of business wisdom, however, to look the facts of every situation squarely in the face, and it is anything but wise to be misled in forecasts of the future by false reasoning. That the predictions of a large business with the Transvaal and the Orange Free State after the close of the present war, especially in machinery, tools, builders' hardware, railroad supplies and the like will be realized is no doubt true. It is well to remember, however, that no economic truth is more elementary, or more firmly established by experience in all ages, than that benefit cannot result from the destruction of any form of wealth by any cause. Those who fail to recognize the axiomatic character of this basic proposition of political economy are incapable of clear reasoning. The fact that so many fail to grasp and assimilate it explains why people with a certain bent of mind are able to discover in a great conflagration a blessing very thinly disguised, if disguised at all, in that it stimulates the demand for building materials, advances prices and gives employment to labor at emergency wages. No doubt there are many people so temperamentally optimistic that such reasoning commends itself to them as sound and practical. We remember to have heard this sort of

talk many times after such public calamities as the Chicago and Boston fires, the Franco-Prussian war, and like events. Optimism of this character is very cheerful—but so are the illusions of paresis. Business men who reason in this way show that they have learned to look at events through lenses of very short focus, adapted to magnify by many diameters everything within their immediate field of vision and render everything else invisible.

However regarded, the waste of war is an irreparable public calamity. Under no conceivable conditions can it become a benefit. That it immediately stimulates certain lines of business and advances prices is true; but that this is beneficial will not be true until the natural law establishing the equality of action and reaction is repealed or rendered inoperative. Replacement adds nothing to the wealth of nations; on the contrary, it creates a scarcity somewhere—perhaps everywhere. It represents work expended on the unfinished web of Penelope, or the labor of Sisyphus. Every pound of material consumed, and every hour of labor employed in replacing something destroyed, however necessary such replacement may be, is, after all, only a partial regaining of lost ground. When new machinery and tools have taken the place of those wrecked; when the tracks are relaid, the bridges rebuilt, the engines and cars repaired and the thousand wounds inflicted on national prosperity are scarred over, we are, at most, only where we were before the war began—but with this difference: What we have is burdened with double, or often more than double, the cost of what we had. In the competition of nations this increased cost is a perpetual handicap for those upon whom it devolves. The books of a nation cannot be balanced by a debit to profit and loss. Such a balance may be forced, but the fact remains that the waste of war is never made up by anything which follows the return of peace. If this were not true war would be an international blessing, and the greatest statesman would be the one most skillful in stirring up strife and involving nations in contentions admitting of no other arbitration than that of the sword. We might also welcome conflagrations, earthquakes, floods, tornadoes and like destructive phenomena, and measure their advantages by the amount of property they destroyed. Equally might we regard plague, pestilence and famine, the failure of crops, epidemics among cattle, the frost blight of fruit buds and other countless drawbacks to the attainment of plenty as causes contributing to national prosperity.

If there ever was a time when war brought advantages compensating its waste it is not so now. It may be that the foundations of civilization needed to be laid in blood and ashes, and that the rude shocks of war broke down the barriers of barbarism and diffused useful knowledge. The student of history may discover that the successive cyclones of world conquest which swept over Asia and Europe from the period of Cyrus to that of Mohammed made for good by diffusing and equalizing civilization. But however much or little warrant may be found for this view, there is none for believing that under present conditions war is other than a calamity too great to be measured by other standards than its own—a condition in which "nothing is so disastrous as victory except defeat;" and that nothing resulting from it in the way of trade stimulus offers any ground for congratulations.

Arrangements are reported to have been made for the insurance of all the properties of the American Sheet Steel Company. The total amount is estimated at \$8,000,000. The deal is being put through by the fire insurance firm of R. A. Waller & Co. of Chicago, who also arranged the insurance for the American Tin Plate Company.

## CORRESPONDENCE.

### The Newark Horizontal Boring Machine.

*To the Editor:* Referring to our letter printed in your issue of February 22, 1900, it will be most agreeable to us, and we believe of interest to the trade in general, if you will give like prominence to the fact that we are in receipt of a perfectly satisfactory explanation of the matter from Schuchardt & Schütte, Berlin. We had been informed from a source that we believed trustworthy that imitations of our horizontal boring machines had been sold in Belgium by the firm in question under the misrepresentation that the machines were from our works. It gives us great pleasure to state that, from the facts given us by Schuchardt & Schütte, we are fully convinced that our informant was in error.

THE NEWARK MACHINE TOOL WORKS.  
NEWARK, N. J., April 7, 1900.

### Individuality and Organization.

*To the Editor:* In your issue of March 29 you have an editorial on "Individuality and Organization," in which you seem to deplore the present hostility of society toward the aggregation of industries and centralization of power in the hands of a few men "surrounded by water," and assert "there never was a period in commercial history when the demand was so great for men of brains, experience and energy," and that the demand had far outstripped the supply.

Now it happens that the writer is a strong and vigorous man and not very old, being but 40, known to all his acquaintances as hard working, reliable and sober. It also happens that for some years the gradual encroachment of trusts has taken from his business one after another interest until he was left to shift to something else. Having accumulations and relations established for some years this was hard to do, even at his time of life, and in attempting it he "went broke" as many others have done. Feeling his ability to be of value in some capacity to any iron or steel management he spent four months of the latter part of last year hunting only one of the places in this "demand" you have pictured.

He stood in line by the hour in Chicago, Cleveland, Detroit, Philadelphia and New York with hundreds of others armed, as he presumes they were, with the best of references, and saw men from 18 to 60 competing for places paying \$8 to \$15 per week. He saw manager after manager and used your columns with diligence to seek such a place as his experience and education would command, having had ten years in furnace and rolling mill practice from clerk to superintendent, with a technical education, and as yet failing to find anything. Admitting that he has not been in actual service for some years, one is not likely to forget the business of his life education, especially when engaged in a line closely allied, and though he has kept up his interest in development he is placed in your disqualified "list of outsiders." What of them? His references have been good and can be multiplied, yet there are very many as good or better to fill each vacancy. They must be reckoned with. See what you can do to demonstrate to one who has a little brains, plenty of energy and gratitude to benefactors, that you were right.

### IRON MERCHANT.

*COMMENT BY THE EDITOR:* The foregoing letter is written by a gentleman who is quite well known in iron circles, and at one time represented important commercial interests. His experience is certainly of a character to make him take the opposite view from that expressed in the editorial to which he refers. And it must be admitted that he is not alone in that experience. Others are equally unfortunate in being unable to secure positions for which they are fitted by business training and natural ability. Nevertheless, we believe that, despite the exceptions to be cited, the statements editorially made are correct. It may and probably will take some time for the effects of the consolidations to be overcome and everybody to be provided with employment who has thus been thrown out. But somewhere in our industrial fabric a place exists for every one of these people if the man and the place could only be brought together.

The Manhattan Elevated Railroad Company of New York City are experimenting with movable stairway elevators, with the view of introducing them for the convenience of the public at the various stations of their road.

The original Ferris wheel, which was operated at the World's Fair in Chicago and cost \$175,000 to build, is to be torn down and sold for scrap. It contains about 2200 tons of iron and steel.

April 12, 1900

**OBITUARY.****MATTHEW J. DURHAM.**

Matthew J. Durham, superintendent of the open hearth department of the Anderson & Du Puy Steel Company, died of consumption on April 1 at his home in McKee's Rocks, Pa., aged 36 years. He was a native of Pittsburgh.

**HARRY H. ENSIGN.**

Harry Hooker Ensign died in New York on April 4 at the age of 41 years. He was formerly a member of the firm of Wooster A. Ensign & Sons, wholesale dealers in iron and steel, of New Haven, Conn.

**JOHN JOSEPH JENNINGS.**

John Joseph Jennings, secretary and general counsel of the New Departure Bell Company, Bristol, Conn., died on the 1st inst., aged 45 years. Mr. Jennings was a well-known and popular member of the Connecticut bar, and a patent and corporation attorney of much ability. He was one of the original incorporators of the New Departure Bell Company and took a lively interest in its development, for many years holding the office of vice-president. Upon him devolved the oversight and active prosecution of the legal and patent interests of the company, a responsibility which he discharged with credit to himself and success to his company.

**EDWIN HEYNER.**

Edwin Heyner of the Avery Stamping Company, Cleveland, Ohio, died at his home in that city on the 29th ult. of typhoid fever. Mr. Heyner was the assistant secretary and treasurer of the company and was a young man of excellent promise. He started with the concern as office boy and worked up in 12 years to the position he held at the time of his death. In his honor the shops were closed Saturday and Monday following his death, and so great was his popularity with the men that the entire force of the employees attended the funeral.

**JACOB R. STEWART.**

Jacob R. Stewart, president of the Bradford Machine Tool Company of Cincinnati, Ohio, died on March 31 from heart disease at Riverside, Cal., while on a pleasure trip to the Pacific Coast. He was a native of Pennsylvania, but went to Cincinnati at an early age. He served through the Civil War with gallantry and distinction and was mustered out a captain. He had been connected with the concern of whom he was president practically all the time since the war. Until recently they were known as the Bradford Milling Company, and for a number of years Mr. Stewart was, successively, workman and superintendent in the works. He was elected president in 1876. He was also vice-president of the manufacturing concern of E. A. Kinsey & Co.

**HORACE CROSBY.**

Horace Crosby, one of Pittsburgh's foremost manufacturers and business men, died on the 5th inst. at his home, 27 Bidwell street, Allegheny, Pa., after a brief illness. He was 52 years of age and unmarried. He was born December 5, 1847, in Belfast, Maine, and was a son of William G. and Anna Crosby. His father was Governor of the State of Maine in the early 50's and belonged to one of the oldest and most prominent families of New England. The deceased began his business career in Boston, associated with his brother-in-law, the late John Hitchcock, and D. W. Hitchcock, in the wholesale boot and shoe business. The Hitchcocks became largely interested in the National Tube Works Company of McKeesport, and in 1881 Mr. Crosby moved to Pittsburgh to become purchasing agent. He filled this position for several years, until he, with Edmund C. Converse and John H. Flagler, organized the Republic Iron Works Company. He was elected treasurer and general manager of the new corporation and served in this capacity until the consolidation of the Republic with the National Tube Works Company in 1891. He became assistant manager of the combined organization and in 1895 was appointed assistant general manager, and was given entire charge of the manufacturing department. When the National Tube Works Company were purchased last year, together with other tube manufacturing plants in the United States, by the National Tube Company, Mr. Crosby was chosen second vice-president and assumed charge of the entire mercantile affairs of the concern. He was filling this position at the time of his death. In addition to his connection with manufacturing interests he was vice-president of the National Bank of McKeesport and one of the owners of the McKeesport & Wilmerding Street Railway. Mr. Crosby was rated by his business associates as a millionaire. He was also prominent socially, being a member of the Duquesne

Club, the Chicago Club, the Manhattan Club of New York and Allegheny Country Club, and was also a member of Tancred Commandery, No. 48, Knights Templar. The only immediate relatives surviving him are two sisters. The remains were taken to the birthplace of the deceased, Belfast, Maine, for interment.

**JOSEPH D. WARREN.**

In the death of Joseph D. Warren, which occurred in Stamford, Conn., April 2, the foundry trade lost one of its oldest representatives, if not the oldest, in the United States. Mr. Warren, who was president of the Stamford Foundry Company, was born in New Canaan, October 2, 1809, but spent practically all his life in Stamford, where he was closely identified with many important interests. As early as 1838 the public local chronicle refers appreciatively to him as a young man whose industry and perseverance and high character personally had already won for him the respect of his friends and neighbors in an uncommon degree. At that period the George E. Waring Foundry, at the head of Atlantic street, was the most conspicuous and promising local industry in the village. With Mr. Waring later became associated Isaac Wardwell, the late James B. Scofield and Joseph D. Warren. Mr. Warren's association with the foundry was on the occasion of Mr. Waring's assignment. Starting in the saddlers' trade Mr. Warren did not give that up when he entered into partnership with Edward Capron, who kept a tin shop and stove store, and was in both lines of business when the Waring assignment was made, and Mr. Warren was chosen as the man to reorganize the business. A settlement was effected with creditors, and a new partnership was formed, Mr. Waring, as well as Messrs. Warren, Wardwell and Scofield (the latter two employees of Mr. Waring), being members of the firm, and under their management the concern prospered. In 1840 the company had moved to the old rolling mill at the Main Street Bridge, a place which had been occupied by some form of milling industry from the very first year that white men came to make their homes in that territory. Here, under the name and title of the Rippowam Company, Messrs. Waring, Scofield and Wardwell did a flourishing business. About 1850 the senior member of the concern, George E. Waring, father of the late Col. Geo. E. Waring, the famous sanitary engineer, retired and the firm became J. D. Warren & Co. They made early arrangements to locate their works in a new place at the head of the old canal to secure advantages of nearer water transportation for their growing business and to get more room. In 1869 they were organized as the Stamford Foundry Company, with J. D. Warren as president, who retained his active business connection with the concern through all the intervening years till his death. He is survived by three children, John Jessup Warren, Mrs. Eugene Beach, wife of Dr. Beach, Gloversville, N. Y., and Mrs. Cyrus Northrup, whose husband is president of the University of Minnesota at Minneapolis. The business of the Stamford Foundry Company, with which he had been so long identified, is one to which, of course, he was able to give but little active attention in recent years, though he remained president of the company to the end. His son, John J. Warren, has been long in the active management, and more recently a grandson, Henry J. Warren, has taken an active share in carrying on the business.

**New Steel Castings Plant at St. Louis.**

The Scullin-Gallagher Iron & Steel Company's steel castings plant, at St. Louis, Mo., is being pushed to completion. The mill buildings were erected by the Koken Iron Works Company of St. Louis, and are now being inclosed. In constructing the plant the designers have had the benefit of new labor-saving devices, and in every possible operation the second handling of material will be avoided.

The gas house is 48 x 80 feet, and contains six Duff patent gas producers, all of which are in position and lined up. The furnace department is 65 x 400 feet, and the molding department 75 x 300 feet, each served by independent electric traveling cranes. These departments are inclosed under a roof in common, having trusses of 140-foot span, supported, however, by an intermediate post system, set off the center line of the building, the posts also carrying the inner girders for cranes. The building for the finishing of castings is 75 x 300 feet, also provided with electric traveling cranes.

The power house is thus far being equipped with two 200 horse-power O'Brien safety water tube boilers, and a St. Louis Corliss engine, 20 x 42 inches, will be direct connected to a 250 kw. Western Electric Company generator.

Commissioner-General Peck says that the United States will be represented at the Paris Exposition by 7000 exhibitors.

# Decreasing Pig Iron Production.

## Stocks Practically Stationary.

Much irregularity in the operations of blast furnaces was again reported in March, due principally to scarcity of fuel, although in some sections difficulty was also experienced in securing sufficient supplies of iron ore. Furnaces have blown out for repairs here and there, and while others on the repairing list are in again, the net result is a slight decrease in the number of active stacks. From these causes the rate of production is now considerably under the high water mark of February 1.

The weekly capacity of the furnaces in blast on April 1 compares as follows with that of the preceding periods:

	Furnaces in blast.	Capacity per week. Gross tons.
April 1, 1900.....	291	280,482
March 1.....	293	292,643
February 1.....	296	298,014
January 1.....	280	294,186
December 1, 1899.....	288	296,959
November 1.....	277	288,522
October 1.....	265	278,650
September 1.....	257	267,335
August 1.....	244	267,672
July 1.....	237	263,363
June 1.....	230	251,062
May 1.....	217	250,095
April 1.....	205	245,746
March 1.....	192	228,195
February 1.....	195	237,639
January 1.....	200	243,516
December 1, 1898.....	195	225,528
November 1.....	196	228,935
October 1.....	192	215,635
September 1.....	186	213,049
August 1.....	187	206,777
July 1.....	185	216,311
June 1.....	190	225,398
May 1.....	194	234,163
April 1.....	194	233,339
March 1.....	193	234,430
February 1.....	184	228,338
January 1.....	186	226,608
December 1, 1897.....	191	226,024
November 1.....	183	213,159
October 1.....	171	200,128
September 1.....	161	185,506
August 1.....	152	165,378
July 1.....	145	164,064
June 1.....	146	168,380

## Charcoal Furnaces in Blast April 1, 1900.

Location of furnaces.	Total No. of stacks.	No. in blast.	Capacity per week.	No. out of blast.	Capacity per week.
New England.....	11	3	274	8	730
New York.....	2	1	100	1	95
Pennsylvania.....	13	0	0	13	670
Maryland.....	4	1	84	3	440
Virginia.....	4	1	48	3	290
Ohio.....	8	1	56	7	475
Kentucky.....	3	0	0	3	200
Tennessee.....	7	5	1,282	2	200
Georgia.....	3	2	510	1	200
Alabama.....	5	4	900	1	100
Michigan, Missouri and Wisconsin.....	15	9	4,900	6	2,600
Texas.....	4	2	434	2	600
Totals.....	79	29	7,838	50	6,600

As compared with previous months the record of active charcoal furnaces stands as follows:

	Furnaces in blast.	Capacity per week.
April 1, 1900.....	29	7,838
March 1.....	29	7,047
February 1.....	32	8,004
January 1.....	30	7,457
December 1, 1899.....	30	7,511
November 1.....	29	7,118
October 1.....	25	6,222
September 1.....	24	5,665
August 1.....	22	6,189
July 1.....	20	6,018
June 1.....	16	4,943
May 1.....	20	4,846
April 1.....	17	4,777
March 1.....	16	4,330
February 1.....	17	4,967
January 1.....	20	6,026
December 1, 1898.....	18	6,018
November 1.....	20	5,947
October 1.....	20	5,732
September 1.....	21	6,293
August 1.....	22	6,459
July 1.....	19	5,647
June 1.....	20	6,762
May 1.....	18	6,571
April 1.....	16	5,716
March 1.....	16	5,470
February 1.....	14	4,734
January 1.....	16	5,442
December 1, 1897.....	19	5,061
November 1.....	19	4,656
October 1.....	20	4,686

## Coke and Anthracite Furnaces in Blast April 1, 1900.

Location of furnaces.	Total No. of stacks.	No. in blast.	Capacity per week.	No. out of blast.	Capacity per week.
New York.....	18	6	6,920	7	3,650
New Jersey.....	7	6	3,500	1	900
Spiegel.....	42	22	500	0	0
Pennsylvania:					
Lehigh Valley.....	29	23	11,662	6	3,000
Spiegel.....	1	1	110	0	0
Schuylkill Valley.....	15	10	6,685	5	3,192
Upper Susquehanna.....	5	3	2,651	2	960
Lower Susquehanna.....	10	10	6,496	0	0
Lebanon Valley.....	13	11	7,721	2	984
Pittsburgh District.....	29	29	62,164	0	0
Spiegel.....	1	1	2,623	0	0
Shenango Valley.....	15	12	15,288	3	3,500
Western Pennsylvania.....	19	15	16,282	4	1,940
Spiegel.....	1	0	0	1	1,000
Maryland.....	4	3	4,746	1	175
Spiegel.....	1	1	735	0	0
Wheeling District.....	10	10	14,151	0	0
Ohio:					
Mahoning Valley.....	18	13	21,448	0	0
Central and Northern.....	11	10	17,339	1	1,500
Hocking Valley.....	2	2	1,197	0	0
Hanging Rock.....	13	11	6,153	2	230
Illinois.....	14	14	23,300	0	0
Spiegel.....	2	2	1,927	0	0
Wisconsin and Minnesota.....	6	5	4,074	1	1,000
Missouri.....	2	1	900	1	350
Colorado.....	12	2	2,093	0	0
The South:					
Virginia.....	21	16	9,877	5	3,200
Kentucky.....	5	4	2,072	1	650
Alabama.....	37	27	22,081	10	6,600
Tennessee.....	13	11	6,881	2	920
Georgia.....	1	0	0	1	450
North Carolina.....	12	1	68	1	352
Totals.....	319	262	281,644	57	34,303

In comparison with previous months the record of the coke and anthracite furnaces stands as follows in gross tons:

	Number in blast.	Capacity per week.
April 1, 1900.....	262	281,644
March 1.....	264	285,506
February 1.....	264	290,010
January 1.....	260	286,729
December 1, 1900.....	253	289,448
November 1.....	248	281,409
October 1.....	241	272,428
September 1.....	238	261,670
August 1.....	222	261,488
July 1.....	217	257,345
June 1.....	204	249,119
May 1.....	197	245,249
April 1.....	188	240,969
March 1.....	175	223,865
February 1.....	178	228,672
January 1, 1899.....	180	227,490
December 1, 1898.....	177	220,510
November 1.....	176	222,988
October 1.....	173	209,903
September 1.....	165	206,750
August 1.....	165	200,318
July 1.....	166	210,664
June 1.....	170	218,636
May 1.....	176	227,592
April 1.....	178	227,623
March 1.....	177	228,060
February 1.....	170	223,604
January 1, 1898.....	172	221,166
December 1, 1897.....	172	220,962
November 1.....	164	208,508
October 1.....	151	195,492
September 1.....	140	180,951
August 1.....	133	161,375

## Furnace Stocks.

Contrary to expectations, stocks of pig iron increased but a trifle during the past month, taking the country as a whole. They increased considerably in certain sections but diminished in others, which kept down the aggregate.

The position of furnace stocks, sold and unsold, as reported to us, was as follows on April 1, the same furnaces being represented as in former months. This does not include the holdings of the steel works producing their own iron.

Stocks,	Nov. 1.	Dec. 1.	Jan. 1.	Feb. 1.	Mch. 1.	Apl. 1.
Coke and Anthracite.....	80,709	94,946	107,291	126,418	162,280	177,650
Charcoal.....	21,834	18,747	20,115	21,918	22,872	19,882
Totals.....	111,543	113,699	127,346	148,336	185,152	197,532

## Warrant Stocks.

We are indebted to the American Pig Iron Storage Warrant Company for the following statement of stocks of warrant iron:

Stocks,	Nov. 1.	Dec. 1.	Jan. 1.	Feb. 1.	Mch. 1.	Apl. 1.
Coke and Anthracite.....	10,300	4,100	3,200	2,800	1,600	1,500
Charcoal.....	6,100	5,200	1,700	1,500	1,400	1,400
Totals.....	16,400	9,300	4,900	4,300	3,000	2,900

The receipts in the warrant yards in March were 1400 tons and the deliveries from the yards were 1500 tons, showing a decrease of stock for the month of 100 tons.

## MANUFACTURING.

### Iron and Steel.

The Sharon Steel Company, who are erecting a blast furnace, open hearth plant and rod mill at Sharon, Pa., have drawn plans for the erection of a very complete office building at that place.

The American Steel Hoop Company have decided to install another continuous mill in their Union Works at Youngstown, Ohio. It will be a duplicate of the continuous mill built several years ago and will contain all the modern features.

The Blairsville works of the American Tin Plate Company, at Blairsville, Pa., are being dismantled and the equipment is being taken to the Demmler works.

It is announced that Jacob S. Coxey of Massillon, Ohio, has decided to locate his new steel casting plant at Mount Vernon, Ohio. Mr. Coxey is to receive a bonus of \$5000, while a bank in Mount Vernon is to float \$100,000 worth of bonds secured by the plant.

The capacity of the New Castle Steel Works of the National Steel Company, at New Castle, Pa., will be increased to 1500 tons per day.

The Carnegie Company of Pittsburgh have agreed to supply the steel that will be necessary to rebuild the convention hall in Kansas City, Mo., destroyed by fire last week. As the Democratic convention is to be held in the hall on July 4, it will be necessary to make record breaking time in the erection of the new building to have it ready for that occasion. The details of construction in case it is rebuilt will be in charge of the Gillett & Herzog Mfg. Company of Minneapolis.

The Ohio works of the National Steel Company, at Youngstown, Ohio, closed down on Saturday evening, April 7, for ten days or two weeks. It is stated that during the shut down some improvements will be made. A number of new hot saws will be put in the rail mill, and this department will probably be started up when the plant again resumes, about April 20.

It is reported that the tin plate plant of the American Tin Plate Company at Bridgeport, Ohio, is to be removed to the Humbert Works, at Connellsville, Pa.

A carpenter and pattern shop at the Homestead works of the Carnegie Company, Homestead, Pa., was burned Saturday night, destroying some valuable drawings.

The Shenango Furnace Company, at Sharpsville, Pa., are putting their No. 2 stack in shape for operation and expect to start it up within a short time. The two stacks will probably turn out about 350 tons of Bessemer iron daily.

The Penn Iron Company of Lancaster, Pa., who have been having considerable trouble with local authorities over the use of the city water, have been offered sites for the location of their plant from three different sections. A very flattering offer was received from the York City Land Company.

The Willamette Iron & Steel Works, Portland, Ore., have been incorporated, with a capital of \$90,000, to conduct an iron foundry. The incorporators are H. W. Corbett, J. Lotan, W. H. Corbett.

The report that the Cherry Valley Iron Works, Leetonia, Ohio, manufacturers of pig and bar iron and soft steel, would replace their present blast furnace with a new one is untrue.

The puddlers employed by the Duncannon Iron Company, Duncannon, Pa., who went on a strike, demanding \$4.50 per ton for boiling, have returned to work at the old rate of \$4 a ton. This is the price paid by all the mills in the vicinity of Duncannon.

Regarding the reported strike at the plant of the Whitaker Iron Company, Wheeling, W. Va., manufacturers of black and galvanized sheets, we are advised that while a part of the mill was closed down for repairs a question of privilege arose between the workmen who were idle from the other mills claiming that under Amalgamated practice they were entitled to a share of the work in other departments, and a portion of the works that was in operation was closed down pending a settlement of the question between the men themselves, which was promptly arrived at. There was not, however, anything in the nature of a strike nor were the company in any respect involved in the decision.

The Spang-Chalfant Company of Pittsburgh, operating the Aetna Iron & Tube Works at Aetna, Pa., have given their mill employees a voluntary advance of 10 per cent. in wages, dating from April 15.

Frank C. Roberts & Co., Philadelphia, Pa., are exceedingly busy. Following is a partial list of work upon which they are engaged as engineers: Two new furnace plants for Laughlin & Co., Limited, Pittsburgh, Pa.; one for National Tube Company, Wheeling, W. Va.; one for Warwick Iron & Steel Company, Pottstown, Pa.; one for Joseph Wharton, Port Oram, N. J.; one for Pennsylvania Furnace Company, Sheridan, Pa.; one

for Dunbar Furnace Company, Dunbar, Pa., and one for Lowmoor Iron Company, Lowmoor, Va. They are making improvements at the following furnace plants: Lebanon Furnaces, Lebanon, Pa.; Saxton Iron Company, Saxton, Pa.; Pennsylvania Furnace Company, Sheridan, Pa.; Covington Furnace, Lowmoor Iron Company, Va., and Hamilton Iron & Steel Company, Hamilton, Ont. In their architectural department they are engaged upon a 17-story office building for the Real Estate Trust Company, a 17-story office building for Henry R. Hallowell and a 10-story office building for the American Bank Note Company.

### Machinery.

The Velte Foundry & Machine Company, Pittsburgh, have applied for a charter of incorporation. The incorporators are Robert Ostermaier, Thomas Kirkpatrick, Ernest E. Jones, Arthur L. Over and A. C. Robertson. They have secured a site at the corner of Home street and Allegheny Valley Railroad, and are erecting a building 60 x 200 feet, which will be used for a gray iron foundry to make machine and rolling mill castings and Siemens gas valves. It is being equipped with several 15-ton pneumatic cranes and will have pneumatic chippers and the latest improved cupolas. Gas engines will be used for motive power. A machine shop 60 x 100 feet will also be erected for the purpose of doing all kinds of machine work.

The American Machine & Foundry Company have leased the plant of the Hanover Foundry & Machine Company, at Hanover, Pa., and after thoroughly re-equipping it will manufacture all the tobacco machinery used by the American Tobacco Company. Ample capital is at the command of the new company and no pains will be spared to make the shop a complete one. A general machinery and foundry business will also be done. They desire catalogues of machine shop and foundry supplies. R. L. Patterson of the American Tobacco Company, New York, is president, Hanson Robinson is vice-president and general manager, J. T. Wilcox is secretary and Thomas M. Brown is treasurer. Both Mr. Robinson and Mr. Brown were for a number of years with the Detrik & Harvey Machine Company of Baltimore. Mr. Robinson will manage the designing and mechanical line and Mr. Brown the selling and office work.

The Lunkenheimer Company of Cincinnati, Ohio, have received an order from the Russian Government for the supply of 900 special bronze valves of sizes varying from  $\frac{1}{4}$  to 3 inches. The valves are intended for industrial plants operated by the State.

The machinists' committee and the officials of the Baltimore & Ohio Railroad, at Cumberland, Md., have agreed on a scale of \$2.35 a day for each man in the shops at that place, the foremen to rate men from \$2 to \$2.60, according to their ability.

The Monongahela Connecting Railroad, owned by Jones & Laughlin, Limited, of Pittsburgh, have ordered two four-wheel switching engines from the Pittsburgh Locomotive Works of Allegheny, Pa., and the Chicago & Eastern Illinois Railroad have ordered five 12-wheel two-cylinder compound locomotives from the same concern.

The Westinghouse Electric & Mfg. Company of Pittsburgh have received a contract for the building of an electric plant, to cost about \$20,000, for the new insane department of the county home at Woodville, Pa.

To assist in meeting the great demand for their positive driving drill chuck the Pratt Chuck Company of Frankfort, N. Y., have found it necessary to install a new 150 horse-power Corliss engine. Their success in their sales department has been almost phenomenal, which they attribute to the fact of their chuck permitting the drill to be worn out without slipping or defacing the drill numbers, thus saving much time to the machinist.

The Ferracute Machine Company of Bridgeton, N. J., press and die manufacturers, have recently sent to the Paris Exposition three separate exhibits, the largest one to be located at Vincennes and the other two in the buildings on the Champ de Mars. These machines number upward of 20 in all, together with various dies, feeding attachments, &c. They include large double crank presses, double and single action drawing presses, cutting, punching and embossing presses, and an automatic armature disk notching machine. One of the exhibits in the United States Government department includes an automatic coining press, a new design of coin miller and an automatic feed coin cutting press. These machines will all be shown in motion, driven by electric motors, some of them arranged individually and some driving short lines of shafting. They have all been shipped in good time, so as to have them ready on the day of opening, providing the exposition authorities do not make delay. The secretary of the company, Fred F. Smith, together with his assistants, Percival H. Smith, Read Elmer and M. Drolet, has gone to Paris to install and operate the machinery in question.

The R. D. Nuttall, Company, Pittsburgh, Pa., manufacturers of gears, are now installed in their new works at Garrison alley and Duquesne way, Pittsburgh. In the buildings formerly occupied by the Westinghouse Electric & Mfg. Company. Included in the equipment of the new quarters are two large gas engines, sold by the Westinghouse Machine Company, and a very complete electrical equipment furnished by the Westinghouse Electric & Mfg. Company. The two 125 horse-power gas engines

provide the power, while generators will furnish the current for motors, doing away entirely with overhead belting. This new plant of the R. D. Nuttall Company is one of the most complete gear cutting establishments in the world.

#### Hardware.

The Stowell Mfg. & Foundry Company, South Milwaukee, Wis., whose malleable plant was destroyed by fire on February 28, resumed operations in their new building on April 2. The new plant is larger and more modern than the old one, many improvements having been incorporated, making it a thoroughly up-to-date foundry. The company's gray iron foundry and other buildings were not destroyed, and their entire works are now running full.

The United States Steel Lock Company, Clinton, Iowa, have recently completed an addition to their works in the shape of a foundry which is complete in all its appointments. This foundry will be utilized for the casting of their small and ornamental work.

We are advised that the sale of the Bigelow patent wire fly killer to the trade this season has already been larger than for any previous season. These goods are attractively arranged in display frames and make fast selling seasonable goods for the hardware trade. J. F. Bigelow, Worcester, Mass., the manufacturer, issues a catalogue and other printed matter relating to the device.

The building at Columbus, Ohio, occupied by the Columbus Bolt Company, penitentiary contractors, was burned on the 3d inst. with a loss of \$100,000, about \$30,000 being the loss of the State.

The Hollinger Fence Company, Greenville, Ohio, advise us that they are prepared to furnish all sizes of spring cotters, flat split keys and riveted keys, and have facilities enabling them to supply wholesale hardware and railway supply houses and large manufacturers of agricultural implements. They also manufacture a line of smooth wire fencing of the Hollinger patent, furnishing it with both the links and wood or steel stays.

#### Miscellaneous.

The Randolph Iron Company, Iron founders, Greenpoint, N. Y., advise us that the report of their foundry plant being destroyed by fire last Sunday night is untrue. It was a terrible conflagration and their escape seemed almost miraculous. Their neighbors, Post & McCord, across the street, suffered great damage, but the fire did not touch the Randolph Iron Company.

The Imperial Plating Works, 113 Morgan street, St. Louis, have lately been established as a branch of the Chicago concern of the same name. They have secured some desirable contracts from stove foundries in St. Louis and say they are also actively engaged on bicycle plating.

The Hoyt Metal Company, St. Louis, makers of bearing metals and solders, are busy in all departments. They mention that a feature noted at present is the quick delivery urged on contracts that are entered into.

The plant of the Lead Reduction Company, which was located on the lands of the Niagara Falls Power Company, at Niagara Falls, has been destroyed by fire. The loss is about \$40,000, on which there was an insurance of about \$17,500. The company had already made preparations to enlarge the capacity of the works and the fire will now inspire them to greater vigor. They will rebuild and the new plant, it is stated, will be ten times the capacity of the plant destroyed. The company are capitalized at \$10,000,000, under the laws of Delaware. Up to this time much of the company's work has been of an experimental nature, but it is claimed that the success of the process has been fully demonstrated.

The McClintic-Marshall Construction Company, recently organized in Pittsburgh and with offices in room 404, Park Building, in this city, have purchased the plant and business of the Pottstown Bridge Company, who have operated the former Cofrode & Sayler Bridge Works, at Pottstown, since May of last year. In addition to operating this plant the McClintic-Marshall Construction Company will erect a new works in Pittsburgh. The officials of the company are Chas. D. Marshall, president, and H. H. McClintic, vice-president and general manager.

At Toledo, Ohio, the Craig Foundry Company will erect a foundry, 65 x 150 feet, and will be ready for business about June 1. The officers of the company are John Craig, president; Benjamin Boutell, vice-president; Walter H. Lefevre, secretary; John F. Craig, treasurer, and Charles T. Wilks, general manager. The company are incorporated, with a capital of \$28,000. The plant will be located near the Craig Shipbuilding Company's yards.

The Niagara Falls Power Company, Niagara Falls, have increased their capital stock from \$3,500,000 to \$6,500,000, consisting of 35,000 shares of a par value of \$100 each. The increase is made in order to enable the company, if called upon, to fulfill their agreement to exchange their debenture bonds, authorized to the amount of \$3,000,000, for stock at par when presented at any time within the next five years.

The Westinghouse Electric & Mfg. Company of Pittsburgh, Pa., have acquired formal possession of the plant of the Walker

Mfg. Company of Cleveland, Ohio, the consideration named being \$500,000. The Walker Company were formerly one of the strongest rivals of the Westinghouse Company in the manufacture of electric street car equipment.

Albert A. Wilcox, receiver of the John Stephenson Company, Limited, will dispose of the immense plant and material at public sale on the premises, at Bay Way, near Elizabeth, N. J., on Wednesday, April 25, at 2 p.m. The grounds embrace nearly 90 acres, and the advantageous position which these works occupy in regard to shipping facilities, either by rail or tidewater; the abundant help near by, the numerous labor saving devices adopted, the system of artesian wells, electric lighting, sanitary arrangements, &c., makes the property extremely desirable for manufacturing purposes. Permit to inspect can be had from the receiver, A. A. Wilcox, room 709, 95 Liberty street, New York.

The Jackson & Sharp Company of Wilmington, Del., have been awarded a contract for the supply of about 125 double-deck trolley cars for use in Paris, France. Some of these cars will be operated in connection with the exposition. The contract is stated to be worth close to \$300,000.

A press dispatch from Detroit, Mich., says that the Detroit Bridge & Iron Works have contracted with the Grand Trunk Railroad of Canada for bridges requiring 4000 tons of material; with the New York Central for elevated driveways over its tracks near Rochester and Syracuse requiring 5000 tons of material; with the Missouri Pacific for bridge work in the Southwest requiring 2000 tons of material, and with the Michigan Central for bridge work along its line requiring 600 tons. These contracts, with an earlier contract with the Grand Trunk covering its international bridge at Buffalo and involving 10,000 tons of material, will keep the concern named busy throughout the summer.

The Eastern Dock & Construction Company have secured by purchase about 50 acres of land at Quincy, Mass., with about a mile of frontage on Fore River, including a long stretch on the channel, for the purpose of establishing a large shipbuilding plant. The Quincy City Council have adopted resolutions setting forth that inasmuch as the company will be the largest of the kind in New England and employ skilled machinists and high grade labor, they will do all in their power to assist the company. About 1000 hands are expected to be on the pay roll when they get under way.

The few employees of the Pittsburgh Reduction Company, at New Kensington, Pa., manufacturers of pure aluminum, who went on strike last week have all returned to work. An agreement was promptly reached and all departments of this large plant are now running full.

Proposals will be received by the Second Assistant Postmaster-General until 2 p.m. of May 3, 1900, for furnishing supplies for the mail equipment shops for the next fiscal year, consisting of wire, rivets, burrs, drills, nuts, screws, oil, acids, leather, twine, thread, cord, files, &c. A complete list of the articles desired and form of proposal will be furnished upon application to the Second Assistant Postmaster-General. Ch. Emory Smith, Postmaster-General, Washington, D. C.

The Pressed Steel Car Company of Pittsburgh have decided to erect a plant alongside their present works at McKee's Rocks, for the building of wooden box cars. The capacity of the new plant will be 50 cars per day. The wooden cars will have a steel under frame, giving the car 20 per cent. greater capacity than that of the ordinary wooden car. The company have an order for 500 of these cars from the Philadelphia & Reading Railroad. Some enlargements are to be made to the Wood's Run works of the same car company. A new boiler house is to be erected and there will be a change in the method of distributing power throughout the works.

The skilled employees of the seven foundries connected with the Edgar Thomson Steel Works of the Carnegie Company, at Bessemer, Pa., were given a banquet by the management of the works in Pittsburgh on Saturday evening, April 7. Recently the foundries broke all records in the amount of work turned out and the banquet was given to the men in appreciation of their faithful services.

The Ohio Coal Traffic Association have announced the rail rates from Ohio, Pittsburgh and West Virginia mines to the lake. The rate from Ohio and Pittsburgh district is 80 cents a ton and from West Virginia 88 $\frac{1}{4}$  cents.

The stove mounters employed by the Pittsburgh Stove & Range Company of Pittsburgh have presented a demand for an advance of about 20 per cent. in wages. They ask for a reply on or before Monday, April 16.

The Blue Bell Iron & Steel Company, Wilmington, Del., have been incorporated, with a capital of \$300,000, the object of the incorporation being stated to acquire mining rights, &c. The incorporators are H. Becker, E. A. Yarnell, J. W. Thompson and H. S. England.

The Franklin Air Compressor Company of Franklin, Pa., have been incorporated, with a capital of \$300,000.

The Wheeling Natural Gas Company, Wheeling, W. Va., have declared a quarterly dividend of 3 per cent., payable April 20.

## The Iron and Metal Trades.

Considerable interest attaches to the figures we publish this week showing the condition of the blast furnaces on the 1st inst. It had been expected that manufacturers' reports would show not only an increase in production, but a decidedly heavy increase in stocks at the furnaces. The complete statistics, however, show that the weekly capacity of the furnaces in operation on April 1 was 3161 tons less than on March 1. This was largely due to the irregularity of furnace operations during March, owing to the scarcity of Coke and in some sections to difficulty in securing a sufficient supply of Iron Ore.

The condition of stocks is also somewhat surprising, as the increase in all kinds of Pig Iron on hand was only 12,380 tons. These figures go far toward explaining the comparative steadiness of prices of Pig Iron during the month, with consumers so generally remaining out of the market. The consumption of Pig Iron is proceeding on a heavy scale and the slight increase in stocks at furnaces was accompanied necessarily by a large reduction in the stocks in foundrymen's yards. It is believed, taking furnace stocks and foundrymen's stocks together, that the supply of Pig Iron in this country at the present time is as low as at any previous period, if indeed it is not considerably lower. The situation is therefore calculated to make large buyers apprehensive, as all consumers are conducting a strictly hand to mouth business, which is liable to have its dangerous side.

The position of Pig Iron abroad constantly grows stronger, advices from Great Britain representing a continuous reduction of stocks, withdrawals from public stores running up to 1500 tons daily. In some districts of England famine conditions prevail with respect to Pig Iron. Several sales for export have been made here during the week, and if freight room could be procured transactions would be much larger. It is stated that No. 3 Southern Foundry has been sold at \$16.50 at furnace for export, which is the full market price.

The situation in Steel and finished materials is not so assuring as in Pig Iron. Billets have been reduced \$1 per ton at Pittsburgh, and weakness prevails in finished products generally, except in Rails, Structural Shapes and Sheets. Some effort is being made to stiffen the market by the shutting down of Steel works and rolling mills. Manufacturers are confident that a better demand will develop when buyers find that strong and concerted efforts are being made to prevent a serious decline.

The foreign demand for finished products is excellent. Sales are being made of Light Rails and other forms of Steel in good quantities, but an especially large export business is being done in Wire Nails and Wire.

## A Comparison of Prices.

At date, one week, one month and one year previous.

### Advances Over the Previous Month in Heavy Type.

#### Declines in Italics.

	Apr. 11, 1900.	Apr. 4, 1900.	Mar. 14, 1900.	Apr. 12, 1899.
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#### PIG IRON :

Foundry Pig, No. 2, Standard, Philadelphia.	\$21.75	\$21.75	\$22.50	\$15.75
Foundry Pig, No. 2, Southern, Cincinnati	20.25	20.25	20.25	14.50
Foundry Pig, No. 2, Local, Chicago.	23.50	23.50	23.50	15.00
Bessemer Pig, Pittsburgh.	24.90	24.90	24.90	15.00
Gray Forge, Pittsburgh.	20.75	21.00	21.00	14.50
Lake Superior Charcoal, Chicago.	25.50	25.50	25.50	17.00

#### BILLETS, RAILS, ETC.:

Steel Billets, Pittsburgh.	\$2.00	\$3.00	\$3.00	25.00
Steel Billets, Philadelphia.	<b>35.00</b>	35.00	34.50	27.50
Steel Billets, Chicago.	nom	nom	36.00	25.50
Wire Rods, Pittsburgh.	nom	nom	nom	nom
Steel Rails, Heavy, Eastern Mill.	35.00	35.00	35.00	26.00
Spikes, Tidewater.	2.60	2.60	2.60	1.70
Splice Bars, Tidewater.	2.20	2.20	2.20	1.35

#### OLD MATERIAL :

O. Steel Rails, Chicago.	18.00	18.00	18.00	11.75
O. Steel Rails, Philadelphia.	23.00	23.50	23.50	15.00
O. Iron Rails, Chicago.	22.00	22.00	22.00	18.00
O. Iron Rails, Philadelphia.	24.00	24.00	25.00	18.00
O. Car Wheels, Chicago.	24.00	24.00	24.00	15.00
O. Car Wheels, Philadelphia.	22.00	23.00	22.00	15.00
Heavy Steel Scrap, Chicago.	17.00	17.00	17.00	12.00

#### FINISHED IRON AND STEEL :

Refined Iron Bars, Philadelphia.	2.10	2.10	2.20	1.50
Common Iron Bars, Youngstown.	2.15	2.15	2.15	1.50
Steel Bars, Tidewater.	2.50	2.40	2.50	1.50
Steel Bars, Pittsburgh.	2.15	2.25	2.25	1.50
Tank Plates, Tidewater.	2.05	2.05	2.15	2.15
Tank Plates, Pittsburgh.	1.90	1.90	2.00	2.00
Beams, Tidewater.	2.40	2.40	2.40	1.63
Beams, Pittsburgh.	2.25	2.25	2.25	1.50
Angles, Tidewater.	2.40	2.40	2.40	1.60
Angles, Pittsburgh.	2.25	2.25	2.25	1.50
Skelp, Grooved Iron, Pittsburgh.	1.95	1.97½	2.00	1.60
Skelp, Sheared Iron, Pittsburgh.	2.10	2.10	2.15	1.90
Sheets, No. 27, Chicago.	3.30	nom	2.20	2.70
Sheets, No. 27, Pittsburgh.	<b>3.10</b>	3.10	3.00	2.50
Galvanized Barb Wire, f.o.b., Pittsburgh.	8.80	8.80	8.80	2.50
Wire Nails, f.o.b., Pittsburgh.	8.20	8.20	8.20	2.00
Cut Nails, Mill.	2.50	2.50	2.50	1.75

#### METALS :

Copper, New York.	<b>17.00</b>	17.00	16.37½	18.50
Spelter, St. Louis.	<b>4.57½</b>	4.40	4.45	6.50
Lead, New York.	4.70	4.70	4.70	4.27½
Lead, St. Louis.	4.55	4.57½	4.57½	4.12½
Tin, New York.	30.40	31.75	33.00	24.50
Antimony, Hallett, New York.	9.75	9.75	9.75	10.00
Nickel, New York.	38.00	38.00	38.00	38.00
Tin Plate, Domestic, Bessemer, 100 lbs., New York.	4.84	4.84	4.84	4.05

## Chicago. By Telegraph.)

Office of *The Iron Age*, 805 Fisher Building, Chicago, April 11, 1900.

Trade is somewhat more cheerful and cheering, but the improvement is not very pronounced. When judged in comparison with the vigor of a year ago it may even be said to be disappointing. Two adverse conditions still dominate: the continued reluctance of manufacturers to buy in excess of their immediate needs and the delays of many new enterprises through the prevalence of strikes. Factories are ordering a little more freely, whether from regained confidence or a growth of necessities assisted likewise by the resumption of activities at many machine shops. As regards new work the inquiries are large, but there is unusual slowness in closing orders, due to the unsettled labor troubles. In a word, the situation may be described as one of natural strength, but laboring under conditions of unusual harassment.

**Pig Iron.**—It is the estimation of one large factor to the Chicago Pig Iron market that the Pig Iron stocks of large foundries in this territory are steadily disappearing. The statement is said to be based upon actual information. It is interesting for the explanation it offers in part for the continued quietude of the market. Trade is confined to small lots, with an occasional sale of 1000 tons or so. The current business is almost wholly for early requirements. Dullness has now intervened for as long a period as any one would have surmised a few months ago, but the melters give scant evidence of changing their policy. If the surmise volunteered above, that the consumers are getting close to the bottom of their flour bin, so to speak, is correct, and if at some time this spring all the melters come into the market at one time, it is, of course, pure conjecture what the effect upon prices will be, but that situation may be facing the market. Echoes from the South are to the effect that sales for foreign shipment are increasing. The Republic Iron & Steel Company have just made their first sale of Pig Iron for European delivery, a lot of 2000 tons. Another sale of 12,000 tons is reported for export from the South. Malleable Iron seems to be the only

high grade that is not in active demand, and its quotation is lower. We quote for cash as follows:

Lake Superior Charcoal.....	\$25.50 to \$26.00
Local Coke Foundry, No. 1.....	24.50 to 25.00
Local Coke Foundry, No. 2.....	23.50 to 24.00
Local Coke Foundry, No. 3.....	22.50 to 23.00
Local Scotch, No. 1.....	25.00 to 25.50
Ohio Strong Softeners, No. 1.....	24.50 to 25.50
Southern Silvery, according to Silicon.....	25.50 to 27.00
Southern Coke, No. 1.....	22.85 to 23.35
Southern Coke, No. 2.....	20.85 to 21.30
Southern Coke, No. 1 Soft.....	22.85 to 23.35
Southern Coke, No. 2 Soft.....	21.85 to 22.85
Foundry Forge.....	20.85 to .....
Gray Forge and Mottled.....	20.85 to .....
Southern Charcoal Softeners, according to Silicon.....	21.85 to 25.85
Alabama and Georgia Car Wheel.....	24.85 to 25.85
Malleable Bessemer.....	24.00 to 25.00
Standard Bessemer.....	..... to .....
Jackson County and Kentucky Silvery, 8 per cent. Silicon.....	32.30 to 32.80

**Bars.**—Small Iron mills are shading the quotations that have previously been named, and the market is at least temporarily in an unsettled condition. But an attempt is also being made to restore values to the former level, and information is that there are very good prospects of early betterment of prices. Some fairly good sized lots have been marketed, but the present inclination of large consumers seems to be to await a more equitable state of market. Steel Bars are firm at 2.35c., and conservative elements are holding Common Iron at 2.30c., while Hoops are steady at 2.65c., base, for Bands. Jobbers quote Common Iron at 2.75c., Soft Steel Bars at 2.50c. to 2.60c., and Norway and Swedish Iron at 4c. to 4.10c.

**Car Material.**—It is noted that builders of cars are specifying ahead of their contracts, one large buyer being now two weeks ahead with a large local order. There is good current demand for Axles and Axle Bills, and new inquiries are in the market for several small lots of cars.

**Structural Material.**—In a small way Structural Shapes are assuming the briskness that naturally belongs to this season, but large trade is in a sluggish condition. The prolongation of strikes in the building trades leaves in its wake a trail of almost wholly unrelieved dullness. Mill shipments are quoted as follows, Chicago delivery: Beams, Channels and Zees, 15-inch and under, and Angles, 3 to 6 inches, 2.40c.; Beams, &c., 18 inches and over, and Angles over 6 inches and under 3 inches, 2.50c.; Tees, 2.45c.; Universal Plates, 2.30c. to 2.40c. From local yards small lots of Beams and Channels are quoted at 2.90c. to 3c.; Angles, 2.65c. to 2.70c. rates, and Tees, 2.75c. to 2.85c.

**Plates.**—Bridge work shows many signs of renewed life in large and small lots. Among mill sales may be mentioned one for 1000 tons. Prices are without quotable change, but the market is not yet convalescing to outward appearances. Quotations on mill shipments, Chicago delivery, are as follows: Tank, 2.20c. to 2.30c.; Flange, 2.45c. to 2.55c.; Marine, 2.75c. to 2.90c.; Fire Box, 3.25c. to 5.50c. Jobbers quote Tank, from store, 2.50c. to 2.75c., and Flange, 2.75c. to 3c.

**Merchant Pipe.**—The current trade from store includes quite a lot of Pipe that it still being delivered on old contracts, producing some variation from the standard quotations which are as follows:

CARLOAD PRICES.		
Sizes.	Black.	Galvanized.
1/8 to 1/2 inch.....	25 and 10	17
1/2 inch.....	25 and three 10s	20, 10, 21/2
3/4 inch.....	25, four 10s and 5	20, two 10s, 21/2
1 to 4 inches.....	25, four 10s, 71/2	20, two 10s and 5
4 1/2 to 12 inches.....	25 and four 10s	20 and two 10s
1 to 4 inches, R. & P.....	25, four 10s, 21/2	20, two 10s, 21/2
LESS THAN CARLOADS.		
Sizes.	Black.	Galvanized.
1/8 to 1/2 inch.....	25 and 21/2	10
1/2 inch.....	25, 10, 10, 21/2	20 and 5
3/4 inch.....	25, three 10s, 71/2	20, 10, 71/2
1 to 4 inches.....	25 and four 10s	20, 10, 21/2
4 1/2 to 12 inches.....	25, three 10s, 21/2	20, 10, 21/2
1 to 4 inches, R. & P.....	25, three 10s and 5	20, 10 and 5

**Sheets.**—Quotations are now heard from store based on the prices named by the American Sheet Steel Company. There is no perfect uniformity as yet, and values range from 3.50c. to 3.60c. for No. 27 from store. Galvanized Sheets are settling down to 70 per cent. from store, and 70 and 5 per cent. with 15c. freight allowance from mill. Quite a fair degree of activity is noted.

**Merchant Steel.**—Business is looking up a little. Consumers are ordering more freely both in size and numbers. There has been an evident improvement in the consumption. Prices are without change. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 2.80c. to 2.90c.; Smooth Finished Tire, 2.80c. to 3c.; Open Hearth Spring Steel, 3.50c. to 3.65c., base; Toe Calk, 3.20c. to 3.50c., base; Sleigh

Shoe, 2.75c. to 3c.; Cutter Shoes, 3.45c. to 3.65c.; Ordinary Tool Steel, 7c. to 7 1/2c.; Special, 13c. and upward.

**Rails and Track Supplies.**—Inquiries hover about the market; a limited number are being closed. Local mills declined during the past few days, about 20,000 tons of Standard Rail offerings, because deliverers asked for could not be granted. Light Rails are selling in fair sized lots. Standard Sections are quoted at \$35 to \$40, and Light Rails at \$37 to \$45. Track Supplies are fairly active. Prices are as follows: Steel Fish Plates, 2c. to 2.25c.; Iron Fish Plates, 2.25c.; Spikes, 2.50c. to 2.60c.; Track Bolts, with Hexagon Nuts, 3.80c. to 3.90c.; Square Nuts, 3.65c. to 3.75c.; Steel Links and Pins, 3c.; Iron Links and Pins, 3c.

**Old Material.**—Offerings have increased, especially from the railways. Some eight or nine lots from that source were in the market this week. The market is generally heavy. No. 1 Wrought has been one of best sellers, but even it is now said to be in abundant supply. Buying has been good. Approximate quotations are as follows, per gross ton:

Old Iron Rails.....	\$22.00 to \$23.00
Old Steel Rails, mixed lengths.....	18.00 to 19.00
Old Steel Rails, long lengths.....	20.00 to 21.00
Relying Rails.....	28.00 to 30.00
Old Car Wheels.....	24.00 to 24.50
Heavy Melting Steel Scrap.....	17.00 to 18.00
Mixed Steel.....	12.50 to 13.00
Iron Fish Plates and Angle Bars.....	21.00 to 22.00
Steel or Mixed Iron and Steel ditto.....	17.00 to 18.00
Iron Car Axles.....	26.00 to 26.50
Steel Car Axles.....	23.00 to 24.00
No. 1 Railroad Wrought.....	21.50 to 22.00
No. 2 Railroad Wrought.....	17.50 to 18.00
Shafting, Iron and Soft Steel.....	18.00 to 19.00
No. 1 Wrought.....	15.50 to 16.00
No. 1 County Wrought.....	14.00 to 14.50
No. 1 Mill.....	11.00 to 11.50
No. 2 Mill.....	7.50 to 8.00
No. 1 Busheling.....	13.00 to 13.50
No. 2 Busheling.....	9.50 to 10.00
Iron Car Axle Turnings.....	13.50 to 14.00
Soft Steel Car Axle Turnings.....	12.50 to 13.00
Machine Shop Turnings.....	11.50 to 12.00
Wrought Drillings.....	11.00 to 11.50
Cast Borings and Drillings.....	8.00 to 8.50
Mixed Borings and Turnings.....	8.00 to 8.50
No. 1 Boilers, cut.....	12.00 to 12.50
No. 2 Boilers, cut.....	6.00 to 6.50
Boiler and Ship Scrap.....	14.00 to 14.50
No. 1 Cast.....	13.00 to 13.50
No. 2 Cast.....	8.50 to 9.00
Railroad Malleable Cast.....	15.00 to 15.50
Agricultural Malleable Cast.....	13.50 to 14.00

**Metals.**—The Metal markets are quiet. Copper is meeting with some favor, with quotations unchanged. Lake is quoted at 17 1/4c., and Casting at 17 1/2c., both carloads. Pig Lead is unchanged at 4.65c. for Desilverized, and 4.75c. for Corroding.

The Western office of the Atlantic Tube Company, manufacturers of Seamless Steel Tubing, has been removed to the Northern Office Building, La Salle and Lake streets. J. W. Bollinger is Western manager.

## Philadelphia.

Office of *The Iron Age*, Forrest Building, Philadelphia, Pa., April 10, 1900.

The hoped for improvement in the Iron and Steel trade has not materialized and, after so many postponements, the trade are beginning to get a little restive. Unfortunately there is nothing immediately in sight which can be taken to indicate that we are verging on either greater activity or on better prices, the outlook, indeed, being distinctly less favorable than for several weeks. There are some firm spots, but they are so palpably artificial that they carry no weight as regards the general situation and are looked upon as a menace to the market rather than a benefit. More than that, it is believed that some very important operations are held in abeyance pending an adjustment of prices which would make it reasonably safe to close contracts and go ahead with the proposed work immediately. In any case there is nothing in the present situation to warrant great haste, and so long as the market remains in its present droopy condition so long will buyers limit their orders accordingly. It is true that prices are not much lower than they were two or three weeks ago, but in a comparative sense there is no business, so that the mere matter of prices is not a matter of much importance anyway. What we want is a good active demand, and with that in evidence there would be no trouble about prices. Prices in many lines are too low already, but if such a course would start things up there is little doubt that manufacturers would make further concessions, but it is not worth while doing it on such business as can be had at the present time. Everybody is waiting to see which way the cat will jump, but on the fence seems to be a satisfactory position *pro tem*.

**Pig Iron.**—Extreme dullness rather than weakness appears to be the trouble at the present time. It is a most difficult matter to secure offers for good or even fair sized lots. Inquiries are made in a way which gives some hope that Iron is going to be taken in larger quantities, but before a deal can be closed it dwindles to small proportions, and so it goes from day to day, carload or at most 100 to 200 ton lots, and very seldom anything that reaches up to 1000-ton lots. This is not because of any really serious falling off in consumption, but is due to the determination to keep clear of forward contracts. There is no clearly defined fear of any serious decline, but, on the other hand, prices seem abnormally high compared with the past several years, and now that supplies are seen to be ample for all probable requirements consumers are content to take their chances week by week or month by month, as the case may be. Stocks in consumers' hands are very light, however, and if the monthly report (which will no doubt be published in this issue of *The Iron Age*) shows a decrease at furnaces there might yet be a very rude awakening. The impression prevails, however, that there will be an increase, but whichever it may be—increase or decrease—it is liable to have an influence on the market, particularly if the changes are important. As regards prices there is little to be said, as they are virtually on the same basis as they were a week ago. They are fairly steady for good Irons, but a little uncertain on other descriptions, so that whether the market is weak or strong depends on what a buyer wants and what a salesman has to offer. There is no indiscriminate buying these days, which is in marked contrast to this time a year ago. The range of prices for seaboard or nearby deliveries would be about as follows: No. 1 X Foundry, \$23.25 to \$24; No. 2 X Foundry, \$21.75 to \$22.50; No. 2 Plain, \$20.50 to \$21.50; Basic, \$22 to \$22.50; Bessemer, nominal, \$22.25 to \$22.50; Low Phosphorus, \$27 to \$28; Charcoal Iron, \$27 to \$29.

**Billets.**—Only small lots are taken, for which \$35 to \$35.50 is asked, but business has been done at less than \$35.

**Plates.**—Demand is disappointing and some of the mills are getting very close to the end of their order books, so that the pressure to secure new business is greater than ever. Prices are supposed to be 2.10c., delivered, but desirable orders can be placed at 2c., and possibly less for something gilt edged. There is a considerable amount of business under consideration, but the unsettled condition of prices has a tendency to retard the prompt closing up of some of the proposed projects. General quotations for lots delivered are about as follows: Steel Plates,  $\frac{1}{4}$ -inch and thicker, 2.05c. to 2.10c.; Shell Plates, 2.15c. to 2.20c.; Flange, 2.40c. to 2.45c.; Charcoal Iron Plates, C. H. No. 1, 2.80c.; Best Flange, 3.30c.; Fire Box, 3.80c.

**Structural Material.**—There is a fairly active market and prices are steady, although no new work has been placed on the market during the past few days. Mills have a great deal of work on hand, however, and are likely to run full for a long time to come. Prices unchanged as follows: Beams and Channels, 15 inches and under, 2.40c.; Angles, 3 to 6 inches, 2.40c.; Zee Bars, 2.40c., f.o.b. Philadelphia; Angle Bulbs and Deck Beams, 2.68c.; Tees, 2.45c.

**Bars.**—The market is in such bad shape that it is hardly possible to quote close prices. It is evident that the Eastern Bar Association is practically dead, as every mill quotes its own price without much regard to what others may be doing. Under such circumstances more or less exaggerated statements get around, but it is probably true that Refined Iron can be done at 2c., delivered; some Bars, said to have been made from new stock, had been sold at less than the price named, but it is a ragged, go-as-you-please market, and it is hardly possible to do more than give the trend of prices without being tied down to exact figures. The range would be about as follows for Philadelphia or nearby deliveries: Ordinary Iron, 1.90c. to 1.95c.; Refined Iron, 2.10c.; Test Iron, 2.20c.; Steel Bars, 2.40c. to 2.50c.

**Sheets.**—The demand is improving and local mills are running to their full capacity. Inquiries are coming in for large lots and prospects are very encouraging for business in the near future. Prices firm but unchanged as follows for best Sheets—viz. (Common Sheets two-tenths less): No. 10, 2.70c. to 2.80c.; No. 14, 2.95c.; No. 16, 3c.; Nos. 18-20, 3.05c.; Nos. 21-24, 3.15c.; Nos. 26, 27, 3.25c.; No. 28, 3.35c. to 3.45c.

**Old Material.**—The weakness in finished stock is reflected in prices of Old Material, although there is not any very distinct change, except that buyers have reduced their bids and appear to be careless whether they are accepted or not. Indications are not in favor of holders at the present time, although it is difficult to secure stock from first hands to leave any margin of profit for handling. Bids and offers are as follows for

deliveries in buyers' yards, seaboard or nearby points: Choice Railroad Scrap, \$23 to \$25; No. 1 Yard Scrap, \$19 to \$20, No. 2 Light Scrap, \$14 to \$14.50; Machinery Cast, \$16.50 to \$17.25; Heavy Steel Scrap, \$22 to \$23; Old Iron-Rails, \$24 to \$25; Old Steel Rails, \$23 to \$23.50; Wrought Turnings, \$15 to \$15.50; Cast Borings, \$13.25 to \$13.75; Old Car Wheels, \$22 to \$22.50; Iron Axles, \$26 to \$28; Steel Axles, \$27 to \$29.

### St. Louis (By Telegraph.)

Office of *The Iron Age*, 1205 Chemical Building, St. Louis, April 11, 1900.

**Pig Iron.**—No new developments have occurred this week, and the volume of business is about the same as for several months. It is asserted that no shading in the price of Southern Irons is made, and quotations such as are going are reported at unchanged prices. Consumption continues out of yards, but furnaces do not have much new business presented to them. Would-be buyers seem afraid to take hold, but it is equally certain that such as have Iron due them do not hesitate to urge its quick shipment. Since the first of the year practically none have refused acceptance of Iron contracted for. In view of the present stand off between buyers and sellers interest attaches to the monthly report of Pig Iron production and stock, which will doubtless appear in this issue of *The Iron Age*. We quote on cars, St. Louis:

Southern, No. 1 Foundry.....	\$22.25 to \$22.50
Southern, No. 2 Foundry.....	21.25 to 21.50
Southern, No. 3 Foundry.....	20.25 to 20.50
No. 1 Soft.....	22.25 to 22.50
No. 2 Soft.....	21.25 to 21.50
Gray Forge.....	20.00 to 20.25

**Bars.**—Trade is jogging along and in a quiet way. Mills are receiving a fair number of orders, but the tonnage involved is small as compared with that in past months. It is apparent that jobbers' stocks are being drawn on by consumers, and although the dealers are thus again benefiting they do not in turn make even equal demands on mills. Prices in this market are unchanged. Mills quote Hoops and Bands, 2.70c., base; Iron Bars, carloads, 2.35c., base, half extras; Steel Bars, carloads, 2.40c., base, half extras; all East St. Louis. Jobbers quote Iron Bars, 2.70c. to 2.90c., base, and Steel Bars, 2.85c. to 3c., base, both full extras.

**Rails and Track Supplies.**—Requisitions for miscellaneous supplies have been very good. The Track improvement season has, however, not yet opened up. We quote Splice Bars, Steel, 2.55c.; Iron, 2.55c.; Track Bolts, with Square Nuts, 3.60c.; with Hexagon Nuts, 3.80c.; Spikes, 2.75c.; Steel Links and Pins, 3.20c.

**Pig Lead.**—The demand is about normal, but some special brands seem to be in especial favor. Soft has been sold at 4.55c. Chemical is nominally, 4.57½c., with but little to be had. Ore remained at \$27 per 1000 lbs.

**Spelter.**—Sales were made this week at 4.57½c. Bids for heavy tonnage were made at 4.55c., but declined by smelters, who look for still higher prices. It is said that export sales of Spelter originating from the Missouri-Kansas fields have approximately equaled domestic purchases credited to same district. Ore was in better value also, and choice grades brought about \$1 advance, selling as high as \$33 per ton, but the nominal top price should be placed at \$32.

Rogers, Brown & Co., formerly at Laclede Building, have moved to the Security Building, St. Louis.

D. L. Cobb, Northwestern agent for the Sloss-Sheffield Steel & Iron Company, has opened an office at 305 Security Building, St. Louis, for the sale of Sloss, Florence, Sheffield and Lady Ensley Irons, with B. F. Miller in charge.

### Cincinnati (By Telegraph.)

Office of *The Iron Age*, Fifth and Main streets, Cincinnati, April 11, 1900.

So far as new business goes the Pig Iron market is practically at a standstill. Transactions consist altogether, so far as can be learned, of very small orders. Bookings for even as much as 100 tons are regarded as large. The call, however, for Iron on old orders shows no material change and the general situation retains its strength. Word from Southern furnaces shows that despite the more favorable weather the output, especially of Foundry and Soft grades, is very unsatisfactory. In the absence of any offers sufficient to test it the price-list remains unchanged. Freight rate from Birmingham is \$3.25 to this point; from the Hanging Rock district, \$1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$21.25 to \$21.50
Southern Coke, No. 2.....	20.25 to 20.50
Southern Coke, No. 3.....	19.25 to 19.50
Southern Coke, No. 4.....	18.50 to 19.00
Southern Coke, No. 1 Soft.....	21.25 to 21.50
Southern Coke, No. 2 Soft.....	20.25 to 20.50
Southern Coke, Gray Forge.....	18.25 to 18.50
Southern Coke, Mottled.....	18.25 to 18.50
Ohio Silvery, No. 1.....	29.00 to 30.00
Ohio Silvery, No. 2.....	28.00 to 29.00
Lake Superior Coke, No. 1.....	23.00 to 23.50
Lake Superior Coke, No. 2.....	22.00 to 23.50
Lake Superior Coke, No. 3.....	21.00 to 21.50

**Car Wheel and Malleable Irons.**

Standard Southern Car Wheel, Chilling Grades.....	\$25.25 to \$26.25
Standard Southern Car Wheel, No. 2.....	24.75 to 25.25
Lake Superior Car Wheel and Malleable.....	25.50 to 26.50

**Plates and Bars.**—Business has been fairly good in Bars, and Plates continue to show increasing strength. Quotations are unchanged, and the mills here are still very busy. We quote, f.o.b. Cincinnati: Iron Bars, carload lots, 2.25c., with half extras; small lots, 2.60c., with full extras; Bar Steel, in car lots, 2.50c., with half extras; small lots, 2.95c., with full extras; Iron Bar Angles, 1½ x 3-16 inch and larger, in car lots, 2.55c.; small lots, 2.80c.; Sheets, No. 10, 2.80c.; No. 27, Stove Pipe, 3.25c.; No. 27, Steel, 3.35c.; Plates, 2.75c. to 3c.

**Old Material.**—The market is rather quiet and prices about as they have been, though tending to weakness. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, \$19 per net ton; Cast Railroad Scrap, \$12 per gross ton; Cast Machine Scrap, \$12 to \$12.25 per gross ton; Axles, \$24 per net ton; Iron Rails, \$21.50 to \$22 per gross ton; Car Wheels, \$22 per gross ton.

**Structural Material.**—Beams and Channels, 15-inch and under, 2.40c. to 2.45c.; over 15-inch, 2.50c. to 2.55c.; Flat Bars, 2.40c. to 2.45c.; Tees, 3-inch and larger, 2.45c. to 2.50c.; Stock Beams, 2.85c. to 3c., all f.o.b. Cincinnati.

**Pittsburgh.**

Office of *The Iron Age*, Hamilton Building,  
PITTSBURGH, April 11, 1900.

(By Telegraph.)

**Pig Iron.**—The Pig Iron market continues very quiet, and while the price of Bessemer is maintained at \$24, Valley, nothing has been done for some days. Forge Iron is also quiet and local Iron is quiet at \$20.75 to \$21. Eastern Forge is quiet at \$20.50 in this market, but this could probably be shaded on a firm offer. Foundry Iron is very dull in demand and prices are weak. We quote Bessemer, \$24, Valley furnace; Southern No. 2 Foundry, \$21 to \$21.50; local No. 2 Foundry, \$22.25 to \$22.40; Eastern Forge, \$20.25 to \$20.50; local Forge, \$20.75 to \$21; Bessemer, \$24.90, for prompt Iron, all f.o.b. Pittsburgh. It is probable that small lots of Bessemer Iron can be bought at less than \$24.90, Pittsburgh, while Eastern Iron is also being offered in this market at less than that price.

**Steel.**—There is very little inquiry for Steel and prices seem to be weak. We quote 4 x 4 inch Bessemer Billets at \$32 to \$32.50, maker's mill. We quote Basic Billets, ordinary carbons, at \$36 to \$36.50, maker's mill.

**Sheet Bars.**—We continue to quote at \$36 at mill for long lengths.

**Spelter.**—Prices on Spelter are firmer and we quote prime Western grades at 4.55c., Pittsburgh.

**Muck Bar.**—We quote at \$32.50 to \$33, Pittsburgh, for standard grades. We note a sale at \$32.90, Pittsburgh.

(By Mail.)

There seems to be an almost utter lack of confidence among buyers, and as a result the policy of placing orders only for small lots and immediate requirements is being rigidly pursued. The tonnage in Finished Material being placed at this time, in comparison with what ought to be done, is frightfully small and is due to the high prices ruling for everything and which buyers evidently do not believe can be sustained. It is true some of the larger finishing mills are pretty comfortably fixed for the next two or three months, but it is also equally true that a good many mills are doing very little, some of them absolutely nothing, on account of lack of orders. One large Steel plant in the Central West is idle this week, presumably for this reason. The

policy mapped out some time ago by the larger interests to restrict production instead of reducing prices is also being observed, and as a result a good many plants are idle, but prices are being fairly well held. Perhaps the most active item on the list of Finished Material is Shapes, for which there is a good demand, and the mills are filled up for the next three or four months. Sheets, on account of the new combination, are strong and will likely be higher. Bars, Plates and Skelp are quiet in demand and prices weak. There is no disguising the fact that spring trade so far has been a severe disappointment and a good deal of apprehension is felt as to the future. It is also claimed that agreements on prices are being evaded. Bessemer Pig Iron is fairly strong at \$24, Valley, for April, May and June, but nothing has been done beyond that delivery. Coke is also in active demand and prices are high.

**Ferromanganese.**—We continue to quote carload lots and larger quantities at \$100 a ton, delivered buyer's mill.

**Structural Material.**—The Carnegie Steel Company have taken the order for about 1700 tons of Shapes for the convention hall at Kansas City, which is to be rebuilt in time for the Democratic convention to be held on July 4. A great deal of tonnage is being figured on, but aside from the above nothing important has been placed in the past week. It is probable the material for the underground railway in New York will be divided among two or three mills. The tone of the market is strong, and we quote: Beams and Channels, 15-inch and under, 2.25c.; over 15-inch, 2.35c.; Angles, 3 to 6 inches, 2.25c.; Angles, smaller than 3 inches and larger than 6 inches, 2.35c.; Flat Bars, 2.10c. to 2.25c.; Pins, 2.25c.; Grooved Rolled Plates, 2.10c.; Universal Mill Plates, 2.15c.; Tees, 3 inches and larger, 2.30c.; Tees, under 3 inches, 2.40c.; Zees, 3 inches and larger, 2.25c., all f.o.b. Pittsburgh.

**Plates.**—Orders for Plates continue to be for small lots, and several of the Plate mills have shut down, claiming that with the present high price of Billets they cannot meet the market. Consumers of Plates are waiting to see what the Pig Iron market will do for third quarter before placing orders. If the present price of Bessemer Pig is reaffirmed for third quarter, and is held, it would probably stimulate the Plate market. As it is now, however, buyers lack confidence and are buying only in small lots. We continue to quote Bessemer Sheared Plates, ¼-inch and heavier, at 1.90c. to 2c., while Open Hearth Basic and Acid Stock is quoted at 2.10c. We quote Shell at 2.10c.; Flange, 2.20c.; Marine, 2.30c.; Fire Box, 2.75c. to 3.25c., depending on quality, all f.o.b. at mill.

**Merchant Steel.**—There is nothing of special interest to note. A fair run of orders for small lots is being placed, but some of the mills are evidently in need of tonnage and are shading prices. We quote: Open Hearth Spring Steel, 3.25c., base; Crucible, 4.50c.; Bessemer Machinery, 2.50c. to 2.60c.; Open Hearth Machinery, 3.25c.; Crucible, 4.50c. to 4.75c.; Hammered Lay Steel, 4c.; Rolled Lay Steel, 3.50c.; Plow Slabs, Bessemer, 2.50c.; Open Hearth, 2.75c.; Tool Steel, 7c. and upward; 25c. freight. Terms, except Tool Steel, 30 days net cash. Tool Steel is sold 60 days, less 2 per cent. off 10 days.

**Bars.**—The situation in Iron and Steel Bars, so far as tonnage is concerned, is very unsatisfactory. Buyers realize that present prices are very high and are buying only in small lots for immediate wants, believing that lower prices are likely. The established price of 2.25c., Pittsburgh, is being held by some of the Bar mills, but outside mills are shading this price from \$2 to \$3 a ton. Small lots of Steel Bars for prompt shipment have sold at 2.15c., f.o.b. Pittsburgh, or lower. The established price of 2.15c., Valley, on Common Iron Bars is also being shaded by outside mills, which have sold Bars delivered in Pittsburgh at very close to 2c. a lb.

**Sheets.**—The final details of the organization of the American Sheet Steel Company are being arranged, and it is intimated that one more leading interest will be taken over before long. The market on Sheets is active and buyers are willing to contract ahead, believing that prices will be higher. We quote No. 27 Black Sheets at 3.10c.; No. 28, 3.20c. Galvanized Sheets are selling at 70 per cent. to 70 and 5 per cent. off, 15c. freight, in carload lots.

**Skelp.**—There is nothing of special interest to note. Demand for Skelp is light and prices are not strong by any means. We quote Grooved Iron and Steel Skelp at 1.95c. to 2c. and Sheared at 2.10c. to 2.25c., f.o.b. Pittsburgh.

**Pipes and Tubes.**—The demand for Pipe is light and is not satisfactory to the mills by any means. However, with favorable weather, it is expected that tonnage will soon materially increase. There is no change in prices.

**Connellsburg Coke.**—Last week there were 19,624 ovens in the Connellsburg region active and 513 idle, the output having been 216,311 tons. There is not much inquiry for Furnace Coke, consumers being well covered. However, some small lots of Furnace Coke for prompt shipment have sold as high as \$4 a ton. The market on Furnace Coke can be quoted at \$3.50 to \$4 a ton, depending on the order and deliveries. There is some inquiry for Foundry Coke for second half, but so far as we can learn few, if any, contracts have been made. We quote Foundry Coke at \$3.50 to \$3.75 a ton, but are advised that in small lots for prompt shipment it has sold at higher prices.

The general offices of the American Steel Hoop Company have been removed from the First National Bank Building to the Empire Building, Fifth and Liberty streets, Pittsburgh. They occupy about three floors in this building.

The billing and engineering departments of the American Tin Plate Company are now located in rooms 1214 to 1219, inclusive, in the Carnegie Building, Pittsburgh. This suite of rooms fronts on Fifth avenue and forms very desirable offices.

### Cleveland.

CLEVELAND, April 10, 1900.

**Iron Ore.**—The probable date of the opening of navigation and speculation as to whether transportation facilities will be adequate to the demands to be imposed during the coming season constitute almost the sole topics of interest in the situation. The sales market is as inactive as it well can be, and it may be expected to continue so until consumers of Pig Iron gain greater confidence in the stability of prices and conditions and buy more freely than they have been doing for some weeks past. Whether the boats will be able to come down with their initial cargoes of Ore any earlier than last season is still problematical. The latest reports as to ice conditions on the upper lakes which have been received here would seem to indicate that it will be approximately the same date as last year (May 5) when the first boats arrive down from Lake Superior, but it would not be surprising if the first Ore laden vessels sail from Escanaba by April 20, or almost ten days ahead of the date of the loading of the first cargo in 1899. Notwithstanding the fact that it is estimated that vessels capable of carrying 18,000,000 tons of Ore are now tied up by season contracts, there appears to be plenty of business offering. The wild tonnage market is likely to present some surprises. It has been supposed all along that the strenuous demand for the movement of the maximum quantity of Ore would draw into the Ore trade at the outset that proportion of the large vessels which as a rule make several trips with grain before entering upon the fulfillment of their Ore carrying contracts. Such a circumstance would naturally tend to hold the wild rate within bounds, but it would appear that in this calculation the Ore shippers reckoned without the grain men. The latter have been searching for tonnage with a fierce activity during the past week, and, in consequence, have bid the rates up to such a figure that it is not only certain that there will be very little wild tonnage on the Ore market as the outset, but equally probably that the wild rate at the outset will be equal to, if not above, the season rate. Little has been done in the wild market as yet, although some vessels have been placed for Escanaba with the understanding that the shipper is to pay whatever rate shall be established.

**Pig Iron.**—The waiting game is still in evidence in all branches of the market. Some of the foundrymen have their requirements covered well into July, but a considerable number are not so fortunate, and they are buying in small lots ranging from a carload to 50 tons, with the invariable stipulation for immediate delivery. The furnacemen contend that stocks in consumers' yards are being reduced far more rapidly than they are accumulated at the furnaces and they predict that when buyers are finally convinced that prices are to go no lower there will be a scramble, in which a portion of those concerned will fare badly. The Bessemer market is quite as strong as the Foundry market in so far as price is concerned, but there is no greater volume of business moving. Most of the consumers of Bessemer are, it is true, better provided than the foundrymen, some of them having covered well into August. One still hears reports of urgent needs for shut downs for the relling of furnaces and protests regarding both the quantity and quality of the Coke supply.

**Finished Material.**—The market is still characterized by unmistakably strong conditions, although the business actually closed up during the past week has reached in volume only fair proportions. The sales agents are hope-

ful, however, and express the belief that buying will ere long be stimulated very largely. They claim that the buyer of finished as well as raw material in the Iron and Steel market has little or nothing to gain by lower prices; for the reason that such concession as he might obtain in his interest would have to be promptly given away to his customers. Indeed, it is said that customers are far more anxious to know that prices are being firmly maintained than they are to secure concessions. There is a suspicion, too, that the buying would be far freer than it is could prospective purchasers feel assured that the price at which they buy is no higher than their competitors might pay now or a little later on. Plates still constitute the weakest factor of the market. Some mills are as yet unprovided with business, and, consequently, no betterment of the existing order of things may be anticipated immediately. Plates have been sold here as low as 1.75c., Pittsburgh, although some of the leading agencies have made no sales under 2c. It may be noted in this connection that the Carnegie Company have secured through their local office the contract for some 1500 tons of Plates for the four new Welland Canal size steamers for which the American Ship Building Company have just closed contracts with A. B. Wolvin of Duluth and others. It is understood that the American Company also have a proposition for the construction of another large Steel freighter, but it is doubtful whether delivery could be made at the time prescribed. Bars are firm at the prices last quoted. The movement in Rails during the week has been light, and the same may be said of the market for Structural Shapes for building purposes, although there is no little business of this class in sight. Included among the contracts which will be let at an early day is one for 2000 tons of Steel for a new building to be erected by a local savings and loan institution.

**Old Material.**—The market is about as quiet as it well could be. Particularly has the movement been light in rolling mill Scrap. The Republic Iron & Steel Company are now the principal consumer and until they are ready to come into the market little activity need be anticipated. We quote: Steel Melting Stock, \$21.50 gross; No. 1 Wrought, \$20 net; No. 1 Cast, \$16 net; Iron Rails, \$25 gross; Car Wheels, \$24 gross; Turnings, \$13 net; Borings, \$11.50 net.

### The British Iron Market.

There has been a very strong tone in all sections of the Iron and Steel trades during the past week. A further improvement is noticeable in the Pig Iron market, especially in Glasgow and in the Cleveland district, where prices have shown a notable advance. In the manufactured branches there has been much animation, while the engineering trades are on the whole doing well, some departments having a plethora of work. The shipbuilding industry is busily employed, and a few new orders have been booked. On the Continent business is brisk, and quotations show little change.

**Pig Iron.**—The position of makers of Pig Iron appears to grow stronger week by week, and a very healthy tone characterizes the market in all the principal centers. In Glasgow an increasing business has been accompanied by rising prices, and in the Cleveland district there has been a more marked upward movement, No. 3, which we last week quoted at 75 shillings, having mounted to the remarkable figure of 77 shillings. Yesterday, however, it eased off to 76 shillings and 6 pence. Iron available for anything like early delivery is in very meager supply, and, indeed, the scarcity in Middlesbrough would appear to amount almost to a famine, the unprecedentedly large shipments having contributed in no small measure to bring about this result. At the same time the difficulty of obtaining supplies of coke and other material renders it almost impossible to increase the output. For Hematite there is a keen demand, which, in conjunction with the inadequacy of the supply, has sent prices of mixed numbers up with a bound, makers asking 87 shillings 6 pence, and buyers readily paying 85 shillings. In Barrow there is also much activity in the Hematite Pig trade, and there is not much Iron for sale.

**Manufactured Iron and Steel.**—There is little change to report in the condition of the manufactured Iron and Steel trades, which are as actively engaged as ever. Prices are firmly maintained all round, but so far no actual upward move is reported, and quotations remain on about the same level generally as last week. The statistics prepared by Mr. Waterhouse for the North of England Board of Conciliation and Arbitration show a continued advance in manufactured Iron, the net average price for January and February—£7 6s. 10½d.—being 9 shillings per ton higher than in the preceding two months. Mr. Macleod's report to the Scottish Manufactured Iron Trade Conciliation Board shows an even greater rise. The resultant increase in wages, combined

with the enhanced prices of raw material, adding as they will do to the cost of production, will, it is thought, bring about an early corresponding movement in the quotations of makers, who assert that if they are to make a reasonable profit under the new conditions they must have an extra margin.

**Engineering and Shipbuilding.**—The engineering industry remains in a satisfactory position, activity being well maintained, and the employment returns of the trade unions showing that full employment is being found for members, the number on out of work benefit being much below the average. There is exceptional pressure in all kinds of electrical engineering and constructive work, and firms engaged in this branch of trade have in prospect a very large amount of work for some time to come. There is little change in the machine tool making, boiler making, locomotive and stationary engine building departments. Work is going on briskly in the shipbuilding yards, and several new orders have been placed during the week.

**Comparison of Prices.**—The annexed table shows the current prices compared with those of last week, and of the corresponding period last year:

	March 29, 1900.	March 22, 1900.	March 20, 1899.
Iron Ore—	s. d.	s. d.	s. d.
Rubio, Middlesbrough.....	21 0	20 9	15 6
Rubio, Cardiff .....	20 0	20 0	14 3
Pottery Mine, North Staffordshire.....	20 6	17 6	14 6
Hematite, West Coast (at mines). .	17 6	17 6	13 6
 Pig Iron—			
No. 3 Foundry, Middlesbrough.....	76 6	75 0	48 6
Warrants, Middlesbrough.....	76 1½	74 9	48 1
Scotch Warrants, Glasgow.....	74 0	73 4	54 9½
Hematite Warrants, West Coast ..	82 5	80 9½	57 4
Cold Blast (Foundry), South Staff-fordshire .....	130 0	130 0	105 0
Welsh Hematite, Cardiff .....	85 0	85 0	61 0
Manufactured Iron and Steel—	£ s. d.	£ s. d.	£ s. d.
Marked Bars, South Staffordshire.....	11 10 0	11 0 0	8 0 0
Common Bars, South Staffordshire.....	10 10 0	10 0 0	6 15 0
Steel Rails, Middlesbrough.....	7 12 6	7 12 6	4 15 0
Steel Rails, West Coast .....	7 7 6	7 7 6	4 12 6
Steel Rails, Cardiff .....	7 10 0	7 10 0	4 17 6
Steel Angles (eng.), Middlesbrough .....	8 12 6	8 12 6	6 17 6
Steel Angles (eng.), Glasgow .....	8 5 0	8 5 0	7 0 0
Steel Plates (ship), Middlesbrough .....	8 5 0	8 5 0	7 2 6
Steel Plates (ship), Glasgow .....	8 12 6	8 12 6	7 2 6
Tin Plates, Bessemer IC Cokes, South Wales .....	s. d.	s. d.	s. d.
	16 9	16 9	11 6

—The Iron and Coal Trades Review, London, March 30.

## New York.

Office of *The Iron Age*, 222-228 William street, NEW YORK, April 11, 1900.

**Pig Iron.**—While the condition of the market is practically unchanged, a more hopeful feeling is springing up among furnace representatives. They are having more inquiries and in some instances these inquiries cover good sized quantities. Consumers are showing a disposition to attempt negotiations for forward delivery. It is confidently expected that the volume of business will show considerable increase from this time. Stocks in foundrymen's hands are at a very low point, and large consumers must soon replenish them or find themselves in quite unsatisfactory condition. Prices are a trifle lower and quotations have been revised accordingly. We quote as follows at tidewater: Lehigh and Schuylkill Irons, No. 1 Foundry, \$23 to \$23.75; No. 2 X, \$21.50 to \$22.50; No. 2 Plain, \$20.25 to \$21.25; Gray Forge, \$18.25 to \$19. Southern brands are quoted as follows: No. 1 Foundry, \$22.50 to \$23; No. 2 Foundry, \$21.25 to \$21.75; No. 1 Soft, \$22.50 to \$23; No. 2 Soft, \$21.25 to \$21.75; No. 3 Foundry, \$21 to \$21.50; Gray Forge, \$19 to \$20.

**Cast Iron Pipe.**—The Water Department of New York City is calling for bids on 3000 tons of Pipe, Valves, Hydrants, &c., to be opened on the 24th inst. General business is still quiet, small lots of small sizes only being in any kind of demand. The independent manufacturers are taking most of this trade. Quotations are continued at \$28 to \$29 per gross ton for 8-inch pipe at tidewater.

**Steel Rails.**—A resale has been made of 6000 tons of 70-lb. Rails at private terms. These Rails were ordered some time since by a railroad company who were unable to take the Rails manufactured. It is understood that not many more Rails are likely to come on the market in this manner. Probably a small lot may come out about the first of next month. Inquiries for Rails continue fairly numerous and manufacturers are expecting considerable business to develop soon. Prices of Standard Sections are held firmly at \$35, at mill in Eastern Pennsylvania. Angle Bars are quoted at 2.25c. to 2.35c., Spikes at 2.60c. to 2.75c., Square Track Bolts at 3.50c. and Hexagonal Track Bolts at 3.75c.

**Finished Iron and Steel.**—A somewhat better demand

is reported for Merchant Bars. Important consumers of Bar Iron have latterly been disposed to cover their requirements a little more freely. Plates are experiencing a better demand, but the large contracts recently noted are still in abeyance. Business is doing in moderate lots only. Nothing of importance has developed in Structural Material. Quite a number of transactions are pending which will take a large quantity in the aggregate, but contracts have not yet been closed. We quote: Beams, 2.40c. to 2.50c.; Angles, 2.40c. to 2.45c.; Universal Mill Plates, 2.10c. to 2.25c.; Tees, 2.40c. to 2.45c.; Channels, 2.40c. to 2.50c. Steel Plates are 2c. to 2.15c. for Tank, 2.20c. to 2.30c. for Shell, 2.45c. to 2.55c. for Flange, 3c. to 3.10c. for Fire Box, and 3.50c. to 4c. for Locomotive Fire Box, on dock. Charcoal Iron Plates are held at 2.80c. for C. H. No. 1, 3.30c. for Flange, and 3.80c. for Fire Box. Refined Bars are 2.15c. to 2.25c.; Common Bars, 2c. to 2.10c.; Soft Steel Bars, 2.40c. to 2.45c., and Hoops, 2.70c. to 2.75c., base, on dock.

**Old Material.**—Old Iron Rails are fairly active at lower prices. A lot of 1000 tons has been sold at \$22, on a line of railroad in this vicinity. Another thousand tons brought a trifle over \$22. It is understood that considerable quantities of Old Iron Rails are likely to come on the market, which have for some time been in the hands of dealers and were held at high prices. The demand for Old Steel Rails has been very good, and prices range from \$21 to \$22, the higher rate being named for delivery at mill.

## Metal Market.

Office of *The Iron Age*, 222-228 William street, NEW YORK, April 11, 1900.

**Pig Tin.**—There was considerable activity as to the fluctuation of prices, but buying and selling was anything but active. After the week's flurry of prices the market settled down to a figure considerably below that quoted last week, notwithstanding the fact that the large holders of spot have placed their figure on a high plane and pretend to hold to it. On Monday last spot was selling as low as 30.35c. and yesterday the metal could be obtained at figures ranging between 30.40c. and 30.75c. To-day, however, a sudden advance in London sent prices upward. Bids were made for spot at 31.35c., but holders made the situation an artificial one by stating that their price was 31.75c. This figure, it is believed, was not held to and 31.40c. is said to be nearer the actual value. The entire situation is the result of manipulation on the part of sellers. Buyers are, in fact, scarce and business here and the demand from the interior are very light. The London market after declining to £135 jumped to-day to £140, but closed easier at £139 for spot and £137 15s. for three months' futures.

**Copper.**—In this market there is no change. Business is said to continue in brisk fashion and prices are the same as quoted last week. The inside figures quoted are 17c. for Lake, 16½c. for Electrolytic, and 16¾c. for Casting stock. The export movement is still good, but not as large as it was a month ago. The exports for the first ten days of this month are estimated to have amounted to 3700 tons. The London market was quiet but firm, closing to-day at £79 for spot and £77 10s. for futures. Best Selected has advanced a pound and is quoted £81 10s.

**Pig Lead.**—The situation remains unchanged both as to price and general condition. The American Smelting & Refining Company quote 4.70c. to 4.75c. for spot and futures, f.o.b. New York. Consumers are buying nothing in advance but only as their requirements dictate. London has advanced a shade, coming to-day £16 16s. 3d.

**Spelter.**—Is considerably firmer and prices have advanced a few points. A fair business is said to be going through. The closing price to-day is 4.72½c. bid and 4.77½c. asked for spot and shipments. During March 2014 tons were shipped from Galveston to Europe. The London market has advanced to £22 7s. 6d.

**Antimony.**—There is no change, Hallett's being quoted 9¾c., and Cookson's 10½c. to 11c.

**Nickel.**—Remains firm and without change, wholesale lots going at 38c. and small lots commanding as high as 50c.

**Quicksilver.**—Wholesale lots of 100 flasks and over are quoted at \$5 per flask of 76½ lbs. London is unchanged at £9 12s. 6d. for Rothschild's and £9 11s. 3d for second hands.

**Tin Plates.**—The market is unchanged, with American Tin Plate Company prices still on a basis of \$4.84 per box of standard 100-lb. Cokes, New York delivery, or 4.65c. f.o.b. mills.

## QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING APRIL 11, 1900.

Cap'l Issued.		Sales.	Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.
\$29,000,000	Am. Car & Foundry, Common...	5,550	163 1/2-16 1/4	15 1/2-16 1/4	-15 1/4	15 -15 1/4	15 -15 1/4	-15
29,000,000	Am. Car & Fy, Pref. (7 1/2 Non-Cu.).	4,777	66 1/2-67 1/4	66 1/2-67 1/4	67 1/2-67 1/2	67 -67 1/2	67 -67 1/2	64 1/2-65 1/4
19,000,000	Am. Steel Hoop, Common.....	7,715	35 1/2-35 1/2	35 1/2-35 1/2	35 -35 1/2	32 1/2-35	32 -33 1/2	32 -33
14,000,000	Am. Steel Hoop, Pref. (7 Cu.)...	1,986	-81	-81	-81	80 -81	80 -80 1/2	
50,000,000	Am. S. & W., Common.....	128,205	56 -56 1/4	56 -56 1/4	56 1/2-56 1/4	54 1/2-56 1/4	51 1/2-54 1/2	50 1/2-52 1/2
40,000,000	Am. S. & W., Pref. (7 Cu.)....	6,100	90 1/2-91	90 1/2-91	90 1/2-91	90 -90 1/2	89 1/2-89 1/2	87 -89
28,000,000	Am. Tin Plate, Common, N. Y. ....	3,910	33 1/2-33 1/2	32 1/2-33 1/2	32 1/2-33 1/2	32 1/2-33	32 1/2-32 1/2	31 1/2-32 1/2
18,000,000	Am. Tin Plate, Pref., N. Y. (7 Cu.)	2,213	-83 1/2	-84	-84	84 -84 1/2	83 1/2-84	
7,500,000	Bethlehem Iron t.....	155	57 1/2-58	-58	-58	-58	-58	
15,000,000	Beth. Steel, Par \$50, \$1 paid in...	550	-	-	-	-17 1/2	17 1/2-17 1/4	-17 1/4
7,974,550	Cambria Iron, Phila *.....	799	43 1/2-43 1/4	-43 1/4	-	-43 1/4	43 1/4-44	-44
16,000,000	Cambria Steel **.....	2,091	21 1/2-21 1/2	-21 1/2	21 1/2-21 1/2	21 -21 1/2	20 1/2-21	20 1/2-20 1/2
11,000,000	Col. Fuel and Iron.....	17,165	48 -49 1/2	48 1/2-49 1/2	48 1/2-49	47 1/2-48 1/2	48 1/2-49 1/2	47 1/2-48 1/2
46,484,300	Federal Steel, Common.....	75,448	48 -49 1/2	49 -50	49 -49 1/2	46 1/2-49	46 1/2-47 1/2	46 1/2-49
53,253,500	Federal Steel, Pref. (6 1/2 Non-Cu.).	6,315	-73 1/2	73 1/2-73 1/2	-73 1/2	73 -73 1/2	72 1/2-73	72 1/2-73 1/2
32,000,000	National Steel, Common, N. Y. ....	12,590	44 1/2-44 1/2	43 1/2-43 1/2	43 1/2-44 1/2	42 1/2-43 1/2	40 -42 1/2	41 -42
27,000,000	Nat'l Steel, Pref., N. Y. (7 Cu.)....	850	-	94 -95	53 1/2-53 1/2	-	-	-94
5,000,000	Penna., Common, Phila.....	-	-	-	-	-	-	-
1,500,000	Penna., Pref., Phila.....	-	-	-	-	-	-	-
12,500,000	Pressed Steel, Common.....	680	53 1/2-53 1/2	-	-53 1/2	-	-53 1/2	-
12,500,000	Pressed Steel, Pref. (7 1/2 Non-Cu.).	100	-	-83 1/2	-	-	-	-
27,352,000	Republic Iron & Steel, Common..	5,785	22 -22 1/2	21 1/2-22	21 1/2-22	21 -21 1/2	20 1/2-21	20 1/2-20 1/2
20,852,000	Repub. Iron & Steel, Pref. (7 Cu.)....	1,570	-66 1/2	65 1/2-66	-66	64 1/2-65 1/2	-	-
20,000,000	Tennessee Coal and Iron.....	15,805	95 1/2-96 1/2	95 1/2-96 1/2	94 1/2-96	92 -95 1/2	91 1/2-94	-97 1/2
1,500,000	Warwick Iron & Steel (par \$10)....	160	-10	-	-	-	-	-

\* Par \$50. \*\* \$4.50 per share paid in. + 6% guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph. † Ex-dividend.

**Bonded Indebtedness:** Am. S. & W., \$130,656; Am. Tin Plate, none; Am. Steel Hoop, none; Cambria Iron Co., \$2,000,000 6% debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Federal Steel Co., \$13,200,000 Illinois 5%, \$7,417,000 E. J. E. R. R. 5%, \$1,600,000 Johnson 6%, \$6,732,000 D & I. R. R. 5%, \$1,000,000 2d D. & I. R. R. 6%, \$10,000 land grant D. & I. R. R. 5%; National Steel, \$2,561,000 6%; Tennessee C. I. & R. R. Co., \$8,367,000 6%, \$1,114,000 7%; \$1,000,000 7% cu. pref.; Pennsylvania Steel, \$1,000,000 5%; Steelton, 1st, 1917, \$2,000,000 5%; Sparrow's Point, 1st, 1922, \$4,000,000, consolidated, both plants; Bethlehem Iron, \$1,351,000 5% maturing 1907. Interest and principal guaranteed by Bethlehem Steel Co. Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co.; Col. Fuel Co. Gen. Mort. 6% \$880,000, Col. Coal & Iron Con. Mort. 6% \$2,810,000, Col. Fuel & Iron Gen. Mort. 5% \$2,303,000. Also outstanding \$2,000,000 preferred stock with accumulated dividends of \$640,000 to June 30, 1899.

## Iron and Industrial Stocks.

Industrial stocks have been fairly active during the week, but prices have steadily receded. The leader in interest was American Steel & Wire, in which some heavy holders were liquidating, causing a lower price to be reached for that stock than at any time since the declaration of the dividend on the common. Other steel stocks were evidently affected sympathetically.

	Bid.	Asked.
American Bicycle Company, Common.....	13	13 1/2
American Bicycle Company, Preferred.....	40	43
American Bicycle Company, Bonds.....	-	85
E. W. Bliss, Common.....	-	137 1/2
E. W. Bliss, Preferred.....	125	-
Diamond State Steel.....	4 1/2	5
International Silver, Common.....	6 1/2	8
International Pump, Common.....	21 1/2	22
International Pump, Preferred.....	67	67 1/2
Otis Elevator, Common.....	29 1/2	30
Otis Elevator, Preferred.....	87 1/2	89
U. S. Projectile.....	105	-
Sloss & Sheffield Steel & Iron, Common.....	27	28
Sloss & Sheffield Steel & Iron, Preferred.....	-	69
Tidewater Steel.....	14	14 1/2
U. C. Cast Iron Pipe Company, Common.....	5 1/2	6 1/2
U. S. Cast Iron Pipe Company, Preferred.....	45 1/2	46 1/2
H. R. Worthington, Preferred.....	115	117
Empire Steel, Common.....	-	20
Empire Steel, Preferred.....	-	60

The annual report of the Sloss Iron & Steel Company, now owned by the Sloss-Sheffield Iron & Steel Company, shows earnings for the year ended January 30, 1900, of \$802,667.64, which, after deducting \$263,753.54 for interest, taxes, depreciation and renewal fund, leaves \$538,914.10 net profits. Out of this a dividend of 1 1/4 per cent. was declared in March. Practically all of this dividend goes to the Sloss-Sheffield Company, as the latter now own all but 30 shares of the 50,000 shares of the capital stock of the Sloss Iron & Steel Company. It should be stated that in addition to the depreciation charge above noted, the Sloss Iron & Steel Company write off for depreciation about 25 cents per ton on their iron output and about 3 cents per ton on coal, so that the amount allowed for depreciation is really much larger than the above item would indicate. The profits of 1899 were made on an average selling price of iron at \$11.10 per ton at Birmingham, whereas the average price now is about \$17. The profit on coal now is about 50 per cent. greater than it was last year.

The American Steel Hoop Company have declared the regular quarterly dividend of 1 1/4 per cent. on the preferred stock, payable April 30.

The American Tin Plate Company have declared the regular quarterly dividend of 1 1/4 per cent. on the preferred stock, payable April 30.

The directors of the Pittsburgh Coal Company met in Pittsburgh last week and declared the second quarterly dividend of 1 1/4 per cent. on the \$32,000,000 of preferred stock, payable April 25. The question of a dividend on the common stock was not discussed and probably will not be until next autumn. Like most of the great industrial combinations, this company operate under a New Jersey charter, and according to the law cannot declare a dividend on the common stock until a

full year's dividend has been paid on the preferred. It is said that the business is proving more profitable than expected.

The Standard Underground Cable Company of Pittsburgh have declared the regular quarterly dividend of 2 per cent., payable April 7.

**A New Shovel for Ore Docks.**—A press dispatch, under date of April 10 from Ashtabula, Ohio, states that a new and wonderful invention for automatically handling iron ore at lake ports, known as the Thew shovel, has been shipped by special train from the factory at Lorain. It is to be set up on the docks of M. A. Hanna & Co. No intimation had previously been given that such a machine was being built. The shovel is operated by three men, and does the work of many. It is learned also that a number of orders from other ports are to be filled at once, and that a force of nearly 100 men are busy on the construction of the shovels. The invention has been tested and found capable of handling 1500 tons per day. It is remarkable in that it moves itself, can shovel material on any side of it, can fill cars, and move them whether on the same track or another track. It has three distinct engines, and the bucket or scoop can be made to cut into piles of ore to any desired distance. This invention will greatly facilitate the handling of the enormous ore traffic of 1900.

The Compressed Air Company, with a capital of \$8,000,000, filed articles of incorporation on Monday. Henry D. Cooke is the president of the new concern, and Gen. C. H. T. Collis vice-president. Headquarters of the company are at 621 Broadway. W. L. Elkins and Thomas Dolan of the Whitely syndicate, which controls the Metropolitan Street Railway Company, are in the directorate of the Compressed Air Company. George E. P. Howard, Henry D. Cooke, Francis R. Foraker, William C. Duxbury, C. H. T. Collis, Howell C. Knight and William H. Kimball are the other directors. The new concern have been formed to absorb the American Air Power Company of New York and the Compressed Air Motor Company of Illinois. President Cooke has issued a statement in which he says that work had already been begun by the company on 28 compressed air cars, which they are building for the Metropolitan Street Railway Company of New York, and that 100 additional cars are to follow, compressed air being the motor power with which all the crosstown lines of the Metropolitan are to be equipped. These cars will be either 30-foot single truck motors or 40-foot double truck motors.

According to the New York *Journal of Commerce*, the leading transatlantic steamship lines are about to put 25 new vessels on the service between New York and Europe, of which five are nearly ready to go into commission, and the other 20 are in various stages of construction. Ten of these steamers belong to American companies. Besides these vessels a considerable number of steamers to be employed exclusively in carrying freight are in process of construction.

### The Hanging Rock Iron Company.

A deal has been consummated by which Rogers, Brown & Co. of Cincinnati and New York secure control of the entire property of Means, Kyle & Co. at Hanging Rock. This property became famous in the old charcoal iron days through the operations of the Pine Grove and Ohio furnaces. It includes 22,000 acres of rich mineral land, favorably located, with a 6-mile railroad to haul the ores and raw material to the furnace or connection with the railroad. Besides iron ore the land has on it a large amount of standing timber, stone quarries of fine building freestone, clay beds for the making of the fire brick that may be used by the company, and other deposits. The reputation of the iron made has been preserved in the high standing gained by the product of the Hamilton Furnace. The new owners have organized as the Hanging Rock Iron Company and have issued a circular dated at Hanging Rock, Ohio, from which the following extracts are taken:

"As this place gave its name to one of the most celebrated iron districts in the country, it seems appropriate that our company should adopt its title. Our property has the deposit of limestone ore which gave the peculiar merit to Pine Grove charcoal iron, and the ore, after calcining, is now used in our mixture for foundry iron. The product of Hamilton will be standard Bessemer, coke malleable, special car wheel and high grade foundry. We shall continue to mine coal, fire clay and limestone. Rogers, Brown & Co. of Cincinnati and branch houses have been appointed selling agents, and inquiries are to be addressed to them."

The officers of the company are D. B. Meacham, president, and Edwin Mc Birney, treasurer, at Cincinnati; E. B. Willard, general manager, and James Bull, secretary, at Hanging Rock.

### The New York Rapid Transit Tunnel.

The subcontracts for building the New York rapid transit tunnel will probably be awarded this week. An engineering feat without precedent anywhere must be undertaken in connection with one of the contracts. The problem is to support on stilts two 26-story buildings, side by side, while taking the ground out from under them, and to do this without disturbing the main structures by so much as an inch. This must be solved by a contractor before he can sign the contract. The buildings are the twin giants at the corner of Park row and Broadway known as the Syndicate Building and the St. Paul Building. The four-track loop of the new tunnel is to pass directly under both of the mammoth structures at a depth of about 18 feet below their foundation courses. The tunnel will pass within 2 feet of the Astor House and will cut into the vaults under the Syndicate Building in the sweep around to City Hall Park. The presence of the buildings alone makes this section the hardest of the 15 which the subcontractors will undertake in the 22 miles of tunneling. The ground in the whole section is pure sand, and, so far as it is concerned, there is nothing but ordinary digging to be done. But to plan some system of "shoring up" by which 18 feet of sand shall be made adequate to uphold a 26-story building is something which no one has previously been called upon to do. When the feat of raising the Times Building, tenants and all, and putting six stories underneath it was performed some years ago, it was thought that the accomplishment must hold the record for a long time.

Proposal blanks have just been issued by Chief Engineer Birdsall of the Department of Water Supply of New York, for furnishing and laying water mains in the Boroughs of Manhattan, the Bronx and Brooklyn. About 3000 tons of cast iron pipe, valves, hydrants, &c., will be required in the work. The Brooklyn work will require 14,200 feet of 12-inch pipe, 34,000 feet of 8-inch pipe, 11,000 feet of 6-inch pipe, 100 tons of branches and special castings, 24 12-inch valves, 63 8-inch valves, 40 6-inch valves and 150 hydrants. The work in Manhattan and the Bronx will require 7000 feet of 12-inch pipe, 8000 feet of 6-inch pipe, 4 12-inch valves, 16 6-inch valves and 34 hydrants. Sealed bids will be received at the office of the Department of Water Supply, 13 to 21 Park row, New York, until 2 p.m. Tuesday, April 24.

A serious fire which devastated several blocks in the Greenpoint section of Brooklyn, N. Y., on Monday morning reached the structural iron works of Post & McCord of New York City, destroying the office building and partially damaging the finishing shop. The company's main shop, housed in a fire proof building, was uninjured, however, the building serving to check the progress of the fire. Nor was any of the stock, consisting of from 3000 to 4000 tons of structural material, damaged. The firm advise us that there will be no delay in the

progress of work on hand and that they are in a position to fill all contracts as usual.

### Trade Publications.

**The Brunner Gas and Gasoline Engines.**—A handsome catalogue has just been received illustrating and describing the Brunner gas and gasoline engines, manufactured by Charles Brunner, Peru, Ill. The special claim made for the Brunner engine is that it has been stripped of many complications found in gas engines as ordinarily constructed, and that it is therefore a peculiarly simple machine, not liable to get out of order quickly. The Brunner engine uses the catch governor, which works in connection with a patent valve actuated mechanism holding open the exhaust valve during the excessive speed of the engine. This permits an engine to run perfectly free, using all the energy or power stored up in the fly wheels from the previous impulse. No idle charges of air are compressed, and an air valve is put on the exhaust pipe near the engine to admit cold air into the cylinders during the time that the exhaust valve is held open. This engine is also equipped with the Brunner patent automatic gasoline and air mixer. The special features of the engine are fully illustrated. Views are also presented of various purposes for which the engine is used, and numerous testimonials from purchasers are given.

**A Local Phase of Labor Combination.**—The Chicago Literary Club, Chicago, Ill., has rendered a public service in printing for distribution a paper with the above title which was read before that body by Samuel Henry Wright. It is a study of a corporate body in Chicago known as the Building Trades Council. The author has dealt with his subject with rare powers of analysis and discrimination, and has thus made a valuable contribution to current literature on the labor question. His style is judicial but severe.

### International Cable Directories.

Revised editions have just been issued of two important publications to those who have occasion to use international telegraphic communications.

One is the "Western Union Telegraphic Code and International Cable Directory," compiled and published by the International Cable Directory Company, New York. This is a volume of nearly 900 pages, containing registered addresses of prominent business houses not only in this country, but in many foreign countries, the full "Universal" Western Union code for transmitting telegrams in cipher, covering all kinds of commercial transactions, cable addresses of banks and trust companies in this country and abroad, and much other information in connection with the general subject.

The other is the "Atlantic Cable Directory of Registered Addresses and Directory Code," published by the Atlantic Cable Directory & Code Company, New York. This is a volume of 660 pages, also containing a list of addresses of domestic and foreign business houses, arranged by geographical location and also classified according to the nature of their business. The code in this volume was compiled by Chas. P. Bruch, assistant secretary of the Postal Telegraph-Cable Company, and is comprehensive in its character, covering all kinds of transactions.

The codes in both these publications have been revised and extended to cover the latest developments in manufacturing and commercial operations. It seems hardly possible to conceive of a phrase covering a mercantile transaction which may require fifteen or more words to express that is not indicated in one or the other of these codes by a single word. The directories have a further value in giving the names and addresses of so many business houses in all parts of the world. The increasing importance of our foreign trade adds value almost daily to all such commercial literature.

A unique pencil advertisement has been put out by the A. Leschen & Sons Rope Company, St. Louis. The exterior of the pencil presents identically the appearance of their Hercules patent wire rope as it is ready for the market.

The Joseph Dixon Crucible Company, Jersey City, N. J., are calling the attention of the trade to the special merits of their silica-graphite paint as a durable protective paint for smokestacks. It is a severe test for paint when a metal surface is exposed to the combined influences of both great degrees of heat and climatic conditions, but this company cite several striking examples of endurance and durability, showing that they have succeeded remarkably well in meeting the requirements necessary.

## The New York Machinery Market.

Office of *The Iron Age*, 232-238 William street, NEW YORK, April 11, 1900.

There is practically no change in the situation. Market conditions remain the same and business is running along at the slow, even pace set a few weeks ago. The few good jobs that find their way into the street are been eagerly set after and purchasers of single machines do not have to hunt very far to find numerous willing sellers. At present the attention of the machine tool district is fastened upon the Government work which is to be awarded within a few days. Most prominent among this work are the deals now being decided by the Navy Department, including a good number of tools for the Pensacola, Fla., and Boston yards. The bids were opened yesterday. Our Washington correspondent advises us that there were 36 bidders for the Pensacola tools, and that owing to the fact that nine sets of proposals were opened yesterday the figures will not be available for several days. The outcome of the Springfield Arsenal job is also being looked forward to with interest. The bids were received last Friday, but it is not expected that the outcome of the contest will be known prior to next Monday. The bids must be tabulated at Springfield and sent with recommendations to Washington, where the recommendations may possibly be altered a little, then they are returned to Springfield, and finally awarded in Washington.

At various times we have alluded to the operations of the Automobile Company of America, who now occupy the entire group of buildings at Marion, N. J., formerly occupied by the Daft Electric Company. The new company have just purchased a fine equipment of machine tools. The purchases thus far included six Gisholt lathes, three Pond planers, six Bausch & Harris horizontal boring mills and upright mills, a Newark boring mill, three Brown & Sharpe Universal grinders, six Brown & Sharpe Universal milling machines, one plain B. & S. milling machine, 30 lathes of various standard makes, six Pratt & Whitney screw machines, three Warner & Swasey screw machines, six cutting off machines, one Vogel crank pin turning machine, several large radial drills and slotters, 20 drill presses, one Bausch & Harris 14-spindle drill, two large Gould & Eberhardt automatic gear cutting machines, one Fellows gear shaper, five blacksmith forges, a power hammer and several trip hammers, several Cincinnati and Smith & Mills' shapers, and a complete pattern shop equipment. The American Gas Furnace Company have furnished a number of brazing tools. Work has begun on buildings for a new body department, where a number of wood working machines will be installed. A painting and finishing department will also be added. At present the company are building only gasoline motor vehicles ranging in size from a small motor-tricycle to heavy trucks. A. T. Otto is the president of the company and A. Fisher is the superintendent of the plant.

The Atlas Foundry & Machine Company, who operate a plant at Cross and Spring streets, Newark, N. J., are building a large modern machine shop and foundry at Belleville, N. J. The company build specialties in textile machinery and will soon be in the market for \$30,000 worth of machine tools.

Dan Olson, managing engineer of the Ystad Eslof Railroad Company of Stockholm, is in this country purchasing machinery and investigating American practices. We understand that he is at the works of the Richmond Locomotive Works at present, arranging for the building of a number of special locomotives.

Machine tools have just been purchased by the New York Air Compressor Company, who will double the capacity of their new Arlington, N. J., plant. The company have been awarded contracts for four duplex air compressors, one of which will go to Mexico, one to England and the other two to factories in this country.

We are informed that the machine shop and templet shop of Post & McCord were destroyed in the great fire of Monday morning which wrecked several factory blocks in Greenpoint, Long Island. The company will rebuild immediately.

The Manhattan Railway Company have placed the order for the four exciter engines with the Hamburg Foundry & Machine Company of Harrisburg, Pa. The engines will each be of 400 horse-power capacity. The Morgan Engineering Company were awarded the contract for the 50-ton electric traveling crane.

The Archer & Pancost Company, Criterion and Flushing avenues, Brooklyn, are disposing of about 100 second-hand machine tools which have been idle at their works for some time. A Liberty street machinery merchant bought a batch of 30 speed lathes from the collection yesterday. The Brooklyn Company are manufacturers of gas fixtures, &c.

S. W. Bowles, New York manager of the Riter & Conley Mfg. Company, reports the sale of several 15 x 47

feet sulphite digesters to the E. B. Eddy Company of Ottawa, and the structural material for a power house to the Sao Paulo Tramway, Light & Power Company of Brazil.

The report that the General Electric Company have secured a stock control of the Siemens-Halske Electric Company of America is now confirmed by President Coffin of the General Electric Company.

The H. W. Johns Mfg. Company of South Brooklyn and 100 William street, New York, have purchased a 300 horse-power Brown engine from Woolston & Brew of 141 Broadway, N. Y. The A. & F. Brown Company of 26 Cortlandt street report the sale of a complete power transmission outfit to a large Japanese silk mill company.

The contract for the cast iron piping and specials of the Houston, Texas, sewage plant was awarded to R. D. Wood & Co. of Philadelphia and New York. No awards were made under the tenders for the lighting plant and pumping machinery, and this material is being readvertised for.

The Prindle Engineering Company of 120 Liberty street have received the contract for supplying the sewage pumping plant to the municipality of Atlantic City, N. J.

R. D. Wood & Co. have just completed their three-years' contract for furnishing pipe to the city of Glasgow, Scotland.

Ford, Bacon & Davis of 85 Liberty street have awarded contracts for the construction of an addition to the power station of the Georgia Electric Light Company of Atlanta, Ga. They have purchased one 1500 horse-power Rice-Sergeant engine, three 500 and one 650 horse-power Babcock & Wilcox boilers, Greene fuel economizers and General Electric generators. The condensing apparatus has not been purchased as yet.

Frederic Nell of London has just purchased from the Buffalo Forge Company of 39-41 Cortlandt street an induced draft apparatus consisting of a number of steel plate fans and cross compound vertical engines. The apparatus is to be installed in a large factory at Sunderland, England.

A large contract for furnishing to the Bedford Electric Light Committee of Bedford, England, a surface condensing plant, circulating pumps and engines was awarded to the Wheeler Condenser & Engineering Company.

Sheriff & Swingley of 120 Liberty street have given a order to the Lane & Bodley Company of Cincinnati for a 1500 horse-power air compressor to be shipped to South Africa.

The discounts on cold rolled and turned shafting have been changed by the Shafting Association. They are now 25 per cent. on carload lots and over and 15 per cent. on smaller lots. The discount was formerly 20 and 5 per cent. on carloads and 20 per cent. on small lots.

It is now stated that work will soon be commenced on the new 3,000,000-bushel grain elevator which the New York Central Railroad expect to erect at Weehawken, N. Y.

The Oxnard Construction Company of 32 Nassau street are purchasing the equipment for a large beet sugar plant which will be erected at Rocky Ford, Col.

Specifications will soon be issued by Pattison Bros. of 141 Broadway, New York, for an isolated electric lighting plant. The plant is to be installed at the new building now being erected at Newark, N. J., by the Prudential Insurance Company. The plant will consist of three 250-kw. and one 150-kw. units. High duty pumping engines will be installed in connection with the elevator system. This contract has been awarded to the Otis Elevator Company.

It is reported that the Coahuila & Zacatecas Railroad of Saltillo, Mexico, will spend upward of \$700,000 in building machine shops with modern equipment and making other similar improvements.

The Chicago Pneumatic Tool Company and the New York Air Compressor Company will remove their offices from 120 Liberty street to 95 Liberty street next week. The companies will occupy the entire tenth floor and will conduct an exhibition room which will contain an electrically driven air compressor and a number of the tools so that they can be seen in actual operation.

F. H. Gottlieb, consulting engineer and contractor, has removed his offices to the Electrical Exchange Building, 136 Liberty street.

George A. Barden, formerly superintendent of the works of the Standard Pneumatic Tool Company, Chicago, has been appointed Eastern agent of that company, with headquarters at 619 Washington Life Building, 141 Broadway, New York.

The General Electric Company are reported to have acquired all the property and interests of the Siemens & Halske Company in America, including their large plant at Chicago.

## The Cleveland Machinery Market.

Office of *The Iron Age*, The Cuyahoga, CLEVELAND, April 9, 1900.

Naturally the absorbing topic of conversation among the machinery manufacturers during the past two weeks has been the strike of the machinists. The strike, which went into effect on March 24, continues to cause the shut down of a number of the largest shops in the city and the trouble seems almost as far from settlement as at the beginning. The situation here is different from what it has been in other large cities, since only two or three leading concerns are members of the National Metal Manufacturers' Association. About 50 of the largest manufacturing concerns have, since the early indications of a strike, organized the Metal Manufacturers' Association of Cleveland, and thus far have not been dominated by the national organization. The machinists' strike at present is confined almost wholly to the shops of these concerns. Thus far the local association has declined to hold any conference with the national or local machinists' officers, although the members of the association are willing at any time to confer with their employees as individuals. The members of the association have held a number of meetings during the past few days and they continue firm in their determination to hold out against the demands of the union. Some of their factories are working with reduced forces, while others are wholly closed down. As yet no effort has been made to import men from other cities, but it is stated to-day that men will be secured wherever they can get them and an effort made to start all of the factories in the city.

The strikers claim to be firm in the belief that they will eventually win and that the manufacturers' association will accede to their demands. Bulletins are issued each day giving the names of the concerns which are alleged to have signed their agreements, and thus far it is claimed that 30 shops have acceded to their demands and are giving ten hours' pay for nine hours' work. They admit, however, that with but one or two exceptions the shops mentioned are small ones and that only about 350 out of the 2200 or 2300 men who struck have returned to work.

As a matter of fact, investigation shows that not more than a dozen shops have actually yielded to their demands and signed an agreement to pay the scale demanded. All of these are small concerns employing from three to 15 machinists, who had work which it was necessary to get out at almost any cost, and in the majority of these cases the agreement was made with the proviso that if the general strike went against the men they were to return to the old scale. One of the concerns in question produces a seasonable article and within two months the shop will be closed down. In other cases the men have returned to work with some slight concessions, while in others practically nothing has been conceded and the men have returned to work of their own will.

The case of the Warner & Swasey Company, the well-known screw machinery manufacturers, furnishes an example of the manner in which the men are being deluded by their leaders into the belief that since one large concern has apparently acceded to their demand the other leading concerns can afford and are bound to yield if the strike is continued to the bitter end. Warner & Swasey employ in the neighborhood of 200 machinists, the majority of them of the highest class. It was announced shortly after the beginning of the strike that this concern, one of the largest in the city, had acceded to the demands of the machinists and would in the future work under the scale demanded. The announcement caused considerable comment among other manufacturing concerns and was undoubtedly an incentive which has caused others to yield.

Out of justice to this concern the writer called this morning at their headquarters and suggested that they make a statement. Mr. Warner of the company expressed himself as pleased at this invitation to place his concern before the public in the right light, saying that he had felt that in some cases the policy of his company had been misunderstood. He stated emphatically that they had never received a communication, much less signed one, from any labor organization. At the time the strike was inaugurated a self appointed representative of the employees visited the office and reported the demands of the union, claiming to represent a majority of the workmen. As a matter of fact he had been in the employ of the company less than two weeks and was unknown, even by name or features, except to but very few of the men. His demands were not acceded to, and at noon of that day about one-quarter of the men remained away from work. That afternoon the self appointed representative sought by the aid of the telephone a conference with the company, but he was told that the employees thoroughly repudiated him and did not consider him a representative in any sense of

the word, and, therefore, no conference was required. No conference with the strikers or any outsiders has since or ever been held. The 150 men who remained faithful have been working without interruption.

The tendency for shorter work hours during the summer time has been met with in various ways in this city, some concerns working but five hours on Saturday, others nine hours each day. Heretofore Warner & Swasey have been running 59 hours per week. It was decided best at the present time to run 55 hours per week, this being chosen by a number of the leading employees without any reference to wages. It has always been the aim of this company to secure as employees workmen of high grade, and to establish wages in accordance with the abilities manifested by each individual workman. This rule has enabled them to gather together a very efficient and intelligent body of employees, one result of which is manifested in the fact that less than one-quarter went out at the time of the labor agitation. The writer asked what had been done about taking back the strikers and was told that the company had decided it best not to make any blacklist, and thereby refuse employment to any men who had gone out, but to offer employment individually to each one of the old employees who might seek it. Many, but not all of them, have returned. The self appointed representative who had been in their employ but two weeks was one of those who made application and he was given work at the same price per hour that he had previously received. It is very evident that the men in this factory have considered it best for their interests to be entirely independent of outside domination, believing that their best interests would be served by maintaining the pleasant relations which have always existed between employer and employee. The Warner & Swasey Company are extremely busy in both their screw machine and instrument departments. They are equipping an entire brass working plant for the manufacture of steam globe valves and steam fittings for the Industrial Company of Mexico, of Chihuahua, Mexico. They have completed a first Government order for range finder telescopes and are at work on a second order, also a large order for prism field glasses for the signal service.

An interesting point came to the writer's notice, showing that men have not bettered their condition by leaving a shop which declined to accede to the demands of the union and becoming employees of a so called "fair dealing" shop. Six men were employed by the Grant Machine Tool Works at \$2.75 per day for ten hours' work. They struck with the others and went to work for a concern which was said to have signed the scale. The manager of the company in question states that the same men are receiving \$2.34 per day for nine hours' work, which is the time the shop is being operated on.

Naturally the strike has caused almost an entire suspension of operations with a number of concerns. Few large contracts are being placed where machine work is required, and many of the firms say they would not accept contracts if they could secure them until the labor trouble is fully settled. A number of concerns who have contracts that must be taken care of are straining every nerve to get out the goods; foremen, superintendents and even general managers are running machines. Nearly all the idle firms state that their customers are treating them with every consideration and, even where strike clauses have not been inserted in contracts, are giving them all the time possible. In a number of cases customers have requested that machines be shipped in an unfinished condition with a view to completing them in their own shops. If the trouble is ended in the near future there will not be the serious loss that might be expected, but if it continues manufacturers are afraid that many orders for machinery will be turned away from Cleveland. Of course the machinery dealers and supply houses are heavy losers. Very little machinery is being ordered by local concerns, and in some cases orders for additional equipment have been canceled.

At least four electric drive power plants are under consideration in this city and vicinity, but the contracts will be delayed until labor troubles settle themselves, since there is a possibility that they will not be needed in the immediate future.

The Westinghouse Electric & Mfg. Company of Pittsburgh have assumed control of the plant of the Walker Mfg. Company and will operate it under their own name. The Westinghouse Company have taken several good contracts in this vicinity recently. Among them are a 120-kw. generator for the municipal lighting plant of Berea, Ohio; a power plant for the Sherwin-Williams Company of this city, consisting of a 120-kw. alternating current generator and seven motors aggregating 50 horse-power, also a 300-kw. direct current generator for an extension of the electrical plant of the Lorain Steel Company at Lorain. Buckeye engines will furnish power for the Berea and Lorain plants mentioned.

The River Machine & Boiler Company acceded to the demands of the striking machinists and are running with a large force. They are very busy with marine boiler work, and, among other large contracts, are at work on a garbage reduction plant for the Syracuse Reduction & Mfg. Company of Syracuse.

The Cleveland Twist Drill Company have a large force at work and report no decline in the general demand for twist drills and tools; the local demand has fallen off considerably, however.

The Standard Tool Company report much the same condition. W. S. Gorton, who has been general manager of both the Standard Tool Company and the Standard Welding Company since the organization of the latter concern last fall, is now devoting his entire attention to the welding company's business. H. A. Higgins, formerly with the American Steel & Wire Company at Chicago, has become general manager of the Standard Tool Company. The Standard Welding Company are rapidly developing their business and are turning their process to new varieties of work almost every week. The latest article to be manufactured by this process is a shuttle spindle for silk weaving machinery. Heretofore these spindles have been made of hard wood, but they are now made of steel tubing running to points at the ends. They are 42 inches in length and weigh less than 12 ounces. The company have a contract for a large number of these spindles.

Foot, Burt & Co. report the demand for their drill press better than ever before. They have a good force of men at work and are preparing to make a foreign shipment of 20 drill presses of various sizes. The tools go to Sanderson & Co. of Copenhagen, Gleanzer, Frearars & Hinboldt of Paris, and Churchill & Sons, London. They also have an order for a very large four-spindle drill for railway work to be shipped to the London & North Manchester Railroad, England. Their American trade is also very good. Among other contracts is one for a number of drilling machines for Hill, Clarke & Co. of Boston. They recently shipped this firm a lot of 50 sensitive drills.

Reade & Bowler, dealers in second-hand machinery, say that their trade at their Pittsburgh branch is increasing beyond expectations. The Cleveland office is making some good sales in the surrounding district, but the local demand has fallen off considerably, especially the demand for small tools and supplies. Among other factory equipments they are offering for sale the complete equipment of the Shelby Rolling Mill, located at Helena, Ala.

E. F. Dyer & Co. have commenced work on the beet sugar refinery being erected by the Continental Sugar Company of this city at Fremont, Ohio. The plant is to be a mammoth affair constructed of stone and brick and is the first of its kind in this section. The machinery is being built to the specifications of Dyer & Co. by an Eastern firm.

The strike in Cleveland is having the effect of improving labor conditions in surrounding towns. A number of Cleveland workmen are leaving the city temporarily and securing work outside, so that skilled labor is more plentiful than it has been in some time.

The Horton Mfg. Company, at Painesville, manufacturers of the Hercules brick machines, have increased their force and are now taking care of orders much better. They report the demand for brick machines larger than it has been in some years and are now shipping several machines a week. Their Hercules Sr. machine has a capacity of 60,000 bricks per day and is steadily growing in popularity. The plant of this company is now inadequate to their demands and they are preparing to erect a large plant near the Lake Shore Railroad tracks in that city.

Coe & Wilkes of Painesville report an increasing demand for their veneer cutting machinery. They are now considerably behind on orders. They are building a veneer cutting machine weighing 25 tons which will take a log 5 feet in diameter, to be shipped to the coast. They are at work on a complete interior decorating plant for the Bohn Mfg. Company of St. Paul, Minn., also plants for making tea chests, to be shipped to Glasgow and Holland.

The William Tod Company of Youngstown have secured a contract for a 34-inch and 60 x 60 inch tandem compound condensing engine for the Lukens Iron & Steel Company of Coatesville, Pa. The engine will drive that company's new universal plate mill. It is to be 1800 horse-power and will weigh about 150 tons.

The Mahoning Mfg. Company of Youngstown are stated to be on the market for a milling machine, surface grinder, cold circular saw, drill presses, 150 horse-power gas engine, conveyors, shafting and special machinery. The company are extending their plant and will go into the manufacture of rivets, spikes and railway supplies, with other lines of manufacture in iron and steel in contemplation.

The Morgan Engineering Company of Alliance have

recently shipped a 30-ton electric traveling crane to the William Tod Company of Youngstown.

The machine shop of the Trumbull Mfg. Company of Warren, Ohio, was destroyed by fire last week, entailing a loss of about \$25,000. The company have been rushed with work for several months, but were getting caught up considerably when the fire occurred. The plant will probably be rebuilt at once.

The contracts for the 20,000,000 and 25,000,000 gallon pumping engines required by the Cleveland Water Works Department have not yet been placed. The second lot of bids for these machines was opened recently and the Board of Control decided that the figures for the first mentioned engine were still too high and bids are again being asked for. No action has yet been taken on the bids for the larger engine. The demand for an additional equipment for the high service pumping station has become so imperative that the city has decided to purchase a 10,000,000-gallon engine at once, and specifications will be announced in a few days.

### American Sheet Steel Company.

The final details of the organization of the American Sheet Steel Company have all been practically arranged, and it is expected to have this concern in good working order during this week. The tremendous amount of detail necessary to be arranged in connection with the launching of a concern of this kind can hardly be estimated. We can state, however, that it has been definitely decided that, while the general offices will be located in the Battery Park Building, New York, which is the same building occupied by the National Steel Company and American Tin Plate Company, the billing department will be in Pittsburgh. All the invoices for shipments sent out by the sheet mills owned by the concern will be made up in Pittsburgh, duplicates being sent to New York, with the exception of shipments from the Muncie mill and perhaps one other Western mill, and the billing for these two mills will be made out at Muncie. Geo. G. McMurtry, the president of the company, will remove to New York this week to remain permanently and to take up actively his new duties. In this connection we can state that active negotiations are being conducted with the W. Dewees Wood Company with a view of taking that concern over by the American Sheet Steel Company. The product of the Wood establishment consists largely of specialties and is not ordinary sheets, and for this reason its position is entirely different from that of the other sheet mills which have been absorbed. Aside from the W. Dewees Wood Company, there are only three sheet mills in the West that remain independent, these being Zug & Co., Limited, Pittsburgh; Whitaker Iron Company, Wheeling, W. Va., and the Wellsville Plate & Sheet Iron Company, Wellsville, Ohio. The latter concern are an identified interest of the W. Dewees Wood Company. It is possible that a deal will be made with Zug & Co., Limited, by which the sheet mills of that concern will be purchased by the American Sheet Steel Company. With their close affiliations with the National Steel Company, the American Tin Plate Company and the American Steel Hoop Company, the American Sheet Steel Company will have the sheet trade of the company well in hand, and will have a very commanding position in that trade. We understand that it is the intention of the concern to go after foreign trade in sheets very aggressively.

**A Large English Weigh Bridge.**—W. & T. Avery have constructed at Soho Foundry, Birmingham, England, a ponderous weigh bridge for a northern shipbuilding yard for weighing the immense marine engines required for modern steamships. The machine is entirely self-contained in a huge cast iron frame, and the weighing is accomplished by means of massive levers which convey the weight of the load to the indicating steel yard. The bridge is 25 feet long and, according to the London *Iron and Steel Trades Journal*, is the greatest weigh bridge ever made. It has been thoroughly tested at Messrs. Avery's works, the full load of 100 tons having been put on the platform in the presence of several leading inspectors of weights and measures, who attended for the purpose of seeing the machine tested. The result was that while carrying the full load of

100 tons without any appreciable deflection in any part, it was distinctly sensitive to the addition of a 7 pound weight on the platform, whereas the exacting regulations of the Board of Trade do not require the machine to turn with less than 1,9000 part of its capacity—i. e., 25 pounds.

## PERSONAL.

S. Henry Payne, president of the Payne Engineering Company of New York City, is about to make an extensive tour in the Far East, to occupy about a year. Mr. Payne expects to visit China, Japan, Corea, the Philippine Islands and other Oriental countries before returning home.

Joseph Lythgoe, superintendent and general manager of the Rhode Island Locomotive Works, Providence, R. I., owned and controlled by the International Power Company, will shortly retire from active service. He has been with the works since its establishment. He will take a trip abroad for two or three years. John Howarth, assistant superintendent, severed his connection with that concern on March 31. He had been connected with the works for 30 years. Ill health was the cause of his resignation. John R. McKay, head of the erecting room, has been selected to succeed Mr. Howarth as assistant superintendent.

Andrew Meurer has retired from the tin plate and metal firm of Meurer Bros. Company, Brooklyn, N. Y. Chas. A. Gay of the late firm of T. B. Coddington & Co., New York, has associated himself with Meurer Bros. Company.

Samuel H. Cramp of the William Cramp & Sons Ship & Engine Building Company of Philadelphia sailed for Europe on Tuesday by the "Kaiser Wilhelm der Grosse."

Albert C. Ashton, secretary and treasurer of the Ashton Valve Company, 271 Franklin street, Boston, Mass., has gone abroad with his wife on a short business trip in the interest of his company. It is his intention to attend to the installation of the company's exhibit at the Paris Exposition.

J. N. Maher, formerly superintendent for the Benjamin Atha & Ellingsworth Company, Newark, N. J., has been appointed superintendent of the Scullin-Gallagher Iron & Steel Company, St. Louis, Mo.

C. P. Wheeler of Pickands, Brown & Co., Chicago, has returned from an extended tour through Europe. Mr. Wheeler was especially interested in the pig iron situation abroad, and speaks of the great activity in iron and steel in the countries which he visited.

Edw. K. Holten, secretary and treasurer of the St. Louis Shovel Company, accompanied by his wife, sailed from New York on the 11th on the Red Star liner "Southwark" for a brief visit to Great Britain and the Continent.

Wm. F. Bonnell has resigned his position as district sales agent at Cleveland, Ohio, of the Republic Iron & Steel Company and has associated himself with the Bourne-Fuller Company of Cleveland as manager. R. S. Henderson of Sharon, Pa., has been appointed district sales agent of the Republic Company, with offices at 317 and 318 Perry-Payne Building, Cleveland, Ohio, to succeed Mr. Bonnell.

## The Pittsburgh, Bessemer & Lake Erie Railroad.

The Carnegie Company of Pittsburgh have purchased 10,000 shares of the stock of the Pittsburgh, Bessemer & Lake Erie Railroad from Col. Samuel B. Dick, chairman, for a sum said to be close to \$400,000. Colonel Dick relinquishes the chairmanship of the road, and the position has been abolished. At the annual meeting of the stockholders of the Pittsburgh, Bessemer & Lake Erie Railroad, held in Pittsburgh on April 3, directors were elected as follows: Andrew Carnegie, J. E. Schwab, W. E. Corey, Thos. Morrison, R. A. Franks, T. H. Given, A. M. Moreland, Wm. N. Frew, Edwin S. Mills, Jabez T. Odell, D. M. Clemson, J. Gayley, Thos. H. Wells, Jas. H. Reed, president. The report of operations of the road for 1899 showed:

Gross earnings.....	\$1,854,287.33
Operating expenses.....	1,079,719.49
Net earnings.....	\$774,567.84
Interest and taxes.....	753,858.22
Surplus.....	\$20,709.62

The average train load for the year was 781 tons, as against 659 tons for 1899.

## The British Output of Steel in 1899.

Statistics which have been collected direct from the manufacturers by the British Iron Trade Association show that the total make of open hearth steel in the United Kingdom in 1899 amounted to 3,030,251 tons, of which 2,735,563 tons were acid and 294,688 tons were basic. The output of both descriptions in 1899 was larger than that of any former year. The total increase on the output of 1898 was 223,651 tons.

The total number of open hearth works in Great Britain at the end of 1899 was over 73, while the total number of furnaces was 438.

The statistics which have been furnished to the same association by the manufacturers of Bessemer steel in Great Britain show that in 1899 the tonnage of ingots produced by that process was 1,825,074 tons, against 1,750,386 tons in the year 1898, and 1,884,155 tons in 1897. These figures do not include very small quantities of special steel produced in Sheffield, and at the Royal Arsenal, Woolwich, by the Tropenais process, nor steel by any other system than the regular Bessemer. The increase of make in 1899, compared with 1898, was 65,688 tons. In 1898 the make of ingots was 124,769 tons less than in the previous year, but that decrease was due to the extent of 75,479 tons to the stoppage of the works in Wales, owing to the great coal strike of that year.

The total quantity of Bessemer steel rails produced in the United Kingdom in 1899 was 838,148 tons, against 751,591 tons in 1898, and 921,131 tons in 1897. The home consumption of rails is not now, as it was formerly, limited to rails of home manufacture. In 1899 Great Britain imported 21,394 tons of steel rails from Germany and also a quantity from the United States.

Next after steel rails, the most important finished products of the Bessemer steel industry in 1899 were blooms, billets and bars, followed by plates and angles, and finally by sleepers. There are, however, many subsidiary products of which no returns have been collected, including castings, forgings, tires, axles, &c. Excluding these minor products, the distribution of the make of finished products in each of the last two years comes out as under:

Description.	1898. Tons.	1899. Tons.
Rails .....	751,591	838,148
Plates and angles .....	178,519	158,878
Sleepers .....	42,207	35,743
Blooms and billets .....	316,527	355,335
Bars, &c. ....	189,816	214,951

During 1899 there were 24 Bessemer works and 65 converters in operation in Great Britain. Seven works, with a total of 24 converters, were engaged in the basic, and the remainder were carrying on the acid Bessemer process. Altogether there are now 76 Bessemer converters left in Great Britain.

The total production of puddled bars in the United Kingdom in 1899 amounted to 1,201,606 tons, which is an increase of 85,907 tons on the corresponding production in the previous year. The make of Scotland is substantially the same in both years. The Cleveland district produced in 1899 221,772 tons of puddled bars, against 184,809 tons in the previous year, while South Staffordshire has increased from 238,926 tons to 247,271 tons. Lancashire also shows an advance from 136,189 tons to 154,339 tons, and in West and South Yorkshire there is an advance from 110,101 to 138,834 tons. Shropshire and South Wales, formerly much more important iron making districts, now show an increase from 20,677 tons to 25,200 tons. The only districts that have shown a diminution of output in 1899 are Derbyshire, where there is a drop from 44,500 tons to 41,465 tons; North Staffordshire, where there is a decline from 131,497 to 125,092 tons, and Cumberland, &c., where there is a reduction from 21,325 to 19,871.

The total recorded output of different descriptions of finished iron for each of the last two years is shown below:

Description.	1899. Tons.	1898. Tons.
Bar iron .....	568,956	600,566
Ship plates .....	40,846	57,652
Boiler plates .....	80,552	92,026
Sheets .....	170,556	147,926
Hoops .....	96,243	78,245
Strips .....	58,988	41,817
Angle iron .....	34,860	48,642
Rounds, &c. ....	52,674	49,617
Totals.....	1,103,675	1,116,521

In addition to the above the returns show that a considerable quantity of wire rods continues to be made at the puddled iron works of the country.

**Information Wanted.**—A correspondent wishes the address of a manufacturer who produces a pleating machine, similar, he states, to a fluting machine, but made with rolls, or to do work 40 or more inches wide.

# HARDWARE.

## Condition of Trade.

**R**EPORTS from the jobbers indicate a somewhat improved demand, and the coming of spring is evidently having its effect on the market. The retail trade are, however, buying with a good deal of caution, many of them having sufficient stocks and being a little distrustful of the market. They are therefore limiting their purchases to their requirements. Manufacturers do not complain much of the business they have thus far had, but report a quietness in the market which is somewhat disappointing. It should, however, be borne in mind that many of the jobbers have stocks carried over from last year, and such goods in the present condition of things must be marketed before others are bought. Manufacturers are thus experiencing the results of the very large sales of last year, and with the disposition on the part of jobbing houses to get rid of stocks the market is suffering from the speculative buying which characterized it in 1899. Prices are on the whole fairly well maintained, but in some lines, especially heavy goods which radically advanced, there are indications of a slight softening. Some of the jobbing houses also are cutting prices more or less freely. This feature of the situation is touched upon in another column, where the importance for the general good of the trade of jobbers maintaining prices is emphasized. General conditions throughout the country are excellent, labor being well employed, the agricultural outlook promising, and trade moving along in fair if not exceptionally large volume. Prospects for export business are excellent, and on the whole the outlook is very satisfactory.

### Chicago.

(By Telegraph.)

Weather conditions rule, and a reversion to chill and discomfort has put the brakes upon what was a most promising aspect of the Hardware trade. The rather curious observation is made by a large jobber that recent sales show marked increase in all Western territory to the Pacific Coast, save that immediately tributary to Chicago, not including the trade of the city. The reason assigned by his salesmen is the backwardness of the spring. The early winter was mild, but February and March weather at Chicago was far below the normal in temperature, and the conclusion is that, in April, weather has the characteristics of March. Trade in this territory is therefore backward. But on the whole the volume of business is of goodly proportions. The business that is current embodies all seasonable articles and denotes uniform consumption save as building operations are checked by the continuance of the strikes in large business centers. Heavy Hardware shows steady gains, both in town and country trade. There is decided improvement in the carload trade, and single orders from jobbers now run at times into lots of several carloads. There seems to be in progress the regular spring revival in manufacture throughout the West, for the growth of business is strong and steady and comes from all tributary territory and from all classes of consumers. Wagon Hardware is in seasonable demand with an upward tendency in values. Following a recent advance, Bent Oak Rims have been marked up again this week 10 per cent.

### St. Louis.

There is a healthy demand for goods of all kinds. The open weather has resulted in a promising inquiry for Farm Supplies, and Steel Goods, Trace Chains, Rings and Single Trees are freely specified in orders. Wheat in this territory is in good shape, although it is admitted that warm rains are much needed. Rains in Texas have been overplenty and in some regions disastrous, but nearer regions have been without rainfall for five weeks. There is more confidence in the market than perhaps existed a month ago. Prices are claimed to be firm and but little cutting is spoken of and that not enough to affect trade. Builders' Hardware is in fair demand. Carpenters' Tools are moving better and the Hardware interests who also handle Machinists' Tools report an unusually satisfactory trade in that line. Wire Cloth is selling at \$1.50 and seems to be in short supply again, although some local concerns say they are in good position to supply their trade. Sale of Poultry Netting is picking up and especially in strictly dairy articles. Quite a stiffening is reported in Galvanized and Black Sheets. There is not the excitement that obtained in the trade last year, and things in general have settled down to the steady trade had when prices are unchanged.

### Notes on Prices.

Wire Nails.—The demand for Wire Nails continues fair but not excessive. The market remains firm at former quotations, which are as follows, f.o.b. Pittsburgh, terms 30 days, 1 per cent. off in 10 days:
To jobbers in carload lots.....\$3.20
To jobbers in less than carload lots.....3.22½
To retailers in carload lots.....3.35
To retailers in less than carload lots.....3.45

New York.—There is no noticeable change in the local Wire Nail market. Orders received cover immediate requirements only. Quotations are as follows:
To retailers, carloads on dock.....\$3.53
To retailers, less than carloads on dock.....3.66
Small lots from store.....3.60

*Chicago, by Telegraph.*—Inquiries from jobbers show a marked increase. One feature especially noticeable is that quick shipments are often urged and a natural interpretation is that many stocks throughout the country are depleted to an unusual degree. The dealer trade is also showing marked revival. The consumptive requirements this spring have been held in check somewhat, but are now quite distinctly in evidence. Prices are unchanged. Single carloads are quoted \$3.53, Chicago, and small lots from stock, \$3.63.

*St. Louis.*—Inquiry continues good for Wire Nails, but nothing of especial note this week. Prices are unchanged at \$3.58, base, St. Louis, for single carloads; smaller lots, \$3.68, base.

*Pittsburgh.*—We are advised that the demand for Wire Nails in the past week has shown some improvement over preceding weeks, and it is confidently believed that trade will increase from this time now that favorable weather has come. Notwithstanding the high price of Wire Nails as compared with a year ago it is thought consumption this spring will be very large. For domestic trade we quote Wire Nails as follows, f.o.b. Pittsburgh, terms 30 days, 1 per cent. off in 10 days:

To jobbers in carload lots.....\$3.20
To jobbers in less than carload lots.....3.22½
To retailers in carload lots.....3.35
To retailers in less than carload lots.....3.45

*Cut Nails.*—The demand for Cut Nails continues about

the same as for the past week or two. The strong arrangement made by the manufacturers seems to be keeping prices pretty regular. Quotations are as follows, f.o.b. Pittsburgh, terms 30 days, 1 per cent. off in 10 days:

1000 kegs and over.....	\$2.50
Carload lots.....	2.55
To jobbers in less than carload lots.....	2.60
To retailers in less than carload lots.....	2.70

**New York.**—Cut Nails are ordered in small quantities, demand not having been quickened by spring influences. Quotations remain as follows:

To jobbers in carload lots on dock.....	\$2.73
To jobbers in less than carloads on dock.....	2.78
To retailers in less than carload lots on dock.....	2.90
Small lots from store.....	2.80

**Chicago, by Telegraph.**—Some sellers report noticeable improvement in the volume of trade; others note a continuance of the previous fair activity. On the whole there are gains. Values are without change, quotations from stock holding at \$2.90.

**St. Louis.**—Prices are unchanged at \$2.90 and volume of business of the usual character.

**Pittsburgh.**—It is claimed the recent agreement made by the Cut Nail manufacturers is being observed. Demand is only moderate and is not as large by any means as it should be at this time of the year. We quote Cut

To jobbers in carload lots.....	\$3.05
To jobbers in less than carload lots.....	3.07½
To retailers in carload lots.....	3.20
To retailers in less than carload lots.....	3.30

**Pittsburgh.**—There is a seasonable demand for Smooth Wire, but not as large as in former years, due no doubt to the high prices. We quote, f.o.b. Pittsburgh, terms 30 days, or 1 per cent. off in ten days, as follows:

To jobbers in carload lots.....	\$3.05
To jobbers in less than carload lots.....	3.07½
To retailers in carload lots.....	3.20
To retailers in less than carload lots.....	3.30

**Wrought Iron Pipe.**—The market on Wrought Iron Pipe is without any important change. The new prices are being put into effect, but this is not entirely accomplished, and a good many Jobbing houses are selling from the old list and at practically former prices. While the manufacturers are desirous of having the jobbers' selling prices as nearly uniform as possible, doubt is expressed as to whether it will be feasible to accomplish this, and even where the new system of prices is put into operation some irregularities are reported. The manufacturers' quotations remain as before, being represented by the following prices for Black Merchant Pipe in carload lots to jobbers, the Galvanized Pipe being 15 points less discount than the simple discount representing the complex discounts given below:

	Pittsburgh. Inch Per cent.	Philadelphia. Per cent.	Boston and East St. Louis. Per cent.	New York and Chicago. Per cent.
1/8, 1/4 and 3/8.....	25, 10, 5 and 2 1/4	25, 10, 5 and 1	25, 10 and 4	25, 10 and 5
1/4.....	25, 10, 10, 5 and 2 1/2	25, 10, 10, 10 and 5	25, 10, 10, 10 and 3	25, 10, 10, 10 and 4
3/8.....	30, 10, 10, 10, 5 and 2 1/2	30, 10, 10, 10, 10 and 4	30, 10, 10, 10, 10 and 1 1/2	30, 10, 10, 10, 10 and 2 1/2
1 to 4 inclusive.....	30, 10, 10, 10 and 10	30, 10, 10, 10, 5 and 2 1/2	30, 10, 10, 10 and 5	30, 10, 10, 10, 5 and 1 1/2
4 1/2 to 12 inclusive.....	30, 10, 10, 10 and 10	30, 10, 10, 10 and 9	30, 10, 10, 10 and 7	30, 10, 10, 10 and 8

Nails, f.o.b. Pittsburgh, terms 30 days, 1 per cent. off in 10 days, at \$2.50 for 1000-keg lots or over, \$2.55 in carload lots and \$2.70 for less than carload lots.

**Barb Wire.**—A slight increase is noticeable in the demand for Barb Wire, but it is not expected to reach the proportion of former years. The market is firm at the following quotations for domestic trade, f.o.b. Pittsburgh, net cash, or 1 per cent. off in ten days:

To jobbers in carload lots, Painted.....	\$3.65
To jobbers in carload lots, Galvanized.....	3.80
To jobbers in less than carload lots, Painted.....	3.67½
To jobbers in less than carload lots, Galvanized.....	3.82½
To retailers in carload lots, Painted.....	3.80
To retailers in carload lots, Galvanized.....	3.95
To retailers in less than carload lots, Painted....	3.90
To retailers in less than carload lots, Galvanized....	4.05

**Chicago, by Telegraph.**—From West, Southwest and Northwest, the inquiries for Barb Wire have within a few days grown handsomely. Plain Wire is also a good seller and Woven Wire is moving with accelerated speed. The entire range of Wire products are among the active Hardware articles. Prices are without change, as follows, Chicago delivery: Single cars of Plain Annealed Wire, \$3.38; Painted Barb Wire, \$3.98; Galvanized Barb Wire, \$4.13, with 10 cents additional for small lots from jobbers.

**St. Louis.**—Barb Wire is moving as freely as can be expected. Former users are confronted by the higher prices of to-day, and are therefore employing every economical method to patch up old fences for the present. Painted in carloads remains at \$4.03; smaller lots at \$4.13, St. Louis. Galvanized commands an advance of 15 cents on these prices.

**Pittsburgh.**—Demand for Barb Wire does not show much, if any, improvement and continues very light. We quote Painted Barb Wire at \$3.65 in carload lots to jobbers, with an advance of 15 cents for Galvanized, all f.o.b. Pittsburgh; terms 30 days, or 1 per cent. off for cash in ten days.

**Smooth Wire.**—The Smooth Wire market is in excellent condition. Demand is on the increase and prices firm. Quotations are as follows, f.o.b. Pittsburgh, terms 30 days, or 1 per cent. off in ten days:

**Stove Boards.**—The market for Stove Boards is in an unsatisfactory and somewhat demoralized condition. The competition between the manufacturers is active and lower prices are current. Orders are being booked by the jobbers in some cases at discount 50 per cent., and lower quotations are obtainable by houses of moderate size from at least some of the manufacturers.

**Tacks.**—Notwithstanding the efforts of the manufacturers to secure some regularity in prices the market remains in an unsatisfactory condition, and the low prices recently developed are still, to at least a certain extent, obtainable.

**Paris Green.**—The market continues firm at former prices with a fair demand. Quotations are as follows:

	Cents.
In Arsenic kegs or casks.....	.13
In kegs, 100 to 175 pounds.....	.13½
In kits, 14, 28, 56 pounds.....	.14½
In paper boxes, 2 to 5 pounds.....	.14½
In paper boxes, 1 pound.....	.15
In paper boxes, 1/2 pound.....	.16
In paper boxes, 1/4 pound.....	.17

**Glass.**—There is no change in manufacturers' prices of Window Glass. Additional independent factories are reported as being about ready to start with workmen from the combined factories. About ten weeks remain for Glass making before the end of the fire, and a portion of the month of June is frequently hot enough to seriously interfere with Glass manufacture. The demand for small Glass continues large in proportion to other sizes. Factory prices for carloads are as follows:

Single strength:	Per cent.
First bracket.....	85 and 25
Second and third brackets.....	89
All above.....	90 and 5
Double strength:	
First five brackets.....	89
60-inch bracket.....	90
70 to 100 inch brackets, inclusive.....	90 and 10 and 5
All above.....	90 and 20

**Paints and Colors.—Leads.**—Demand for White Lead in Oil is seasonable, but no unusual activity exists. Prices are without change as follows: In lots of 500 pounds or over, 6½ cents; in lots less than 500 pounds, 7 cents per pound.

**Oils.**—*Linseed Oil.*—Under date of April 5, the price of City Raw Linseed Oil was advanced 4 cents per gallon, and is now quoted as follows: In lots of five barrels or more, 63 cents; in lots of less than five barrels, 64 cents per gallon. Boiled Oil is 2 cents per gallon extra. State and Western brands are held at 61 to 62 cents for Raw.

**Spirits Turpentine.**—Turpentine has gained a cent in price since our report last week, and is now held at 57 cents for Southerns and 57½ for machine made barrels. Local stocks are light, but arrivals are expected this week. Buyers are naturally holding off in anticipation of lower prices when the new crop begins to move.

### A Danger in the Hardware Market.

**A**T the present time the jobbers bear a most important relation to the Hardware market. They are, to a considerable extent, the distributors of the manufacturers' products to the small trade, and the prices which they make may be taken as representing the market for an important class of merchants.

Most of the jobbers entered on the present season with large stocks of goods purchased at lower prices than are now being quoted by the manufacturers. In view of the uncertainties of the future there has been a general agreement among the jobbing houses that the safest policy was to dispose of goods on hand before purchasing more except in such special cases as the exigencies of business might require. The adoption of this policy gives no reason for criticism or complaint. In carrying it out, however, there has been a growing tendency toward cutting prices until in a great many lines jobbers are making lower prices than the manufacturers.

This is the case to such an extent that it tends to demoralize the market.

This condition of things is attracting the attention of the manufacturers, who are not only getting along without the jobbers' orders, but find that the sale of their goods is interfered with and irregularity introduced into current prices.

The way in which the matter is regarded from the manufacturers' standpoint is indicated in the following letter from a representative Western house:

If this policy is kept up, we see that it is going to cause a general demoralization in the prices on certain lines of goods, and we can also see that if the jobber continues to cut prices below the manufacturer, that he is going to be responsible for the demoralization in prices to a certain extent. If this demoralization comes soon, it will place prices below what the jobbers have sold them to the trade, and they will be compelled to issue credit memorandums to their customers to meet the manufacturers' price, and in some instances it is liable to be below what they have purchased their goods for.

The jobbers have an opportunity, and have for some time past, to make some money out of their stock, but in many cases they have simply been underselling the manufacturer, which to say the least is a very disagreeable situation, and we feel that it is unfair to the manufacturer. We cannot see any really good reason for cutting prices at this time when material is high, and likely to remain high for some time to come.

The matter is thus expressed by a well-known Eastern manufacturer, who has been looking carefully into the present situation:

There is the most determined effort I have ever known to get rid of the cheaper goods together with the dearer goods now, to run down stocks and when compelled to then take goods at ruling prices, but not un-

till compelled to do so. In other words, merchants, especially the large houses, seem to be afraid of this year.

The hesitation of the jobbers is going to stop the factories.

Manufacturers are, as a rule, pursuing a conservative course and maintaining prices. This is with many of them a matter of necessity, as the increased costs of production will not permit a yielding in price. The market is, however, going through a period which tends to test its strength, owing to the fact that last year many more goods were sold to the jobbing trade than they were able to dispose of.

The retail trade are obviously not going to purchase speculatively at this time, and little is to be gained by the jobbers in attempting to force goods on the market at cut prices.

It will be better for all classes of trade if jobbers will stop cutting prices.

### The Iron Age Index Supplement.

**T**HE multitude of manufacturers in the Hardware and Iron field is such as to perplex purchasers who desire to keep well informed in regard to the different lines. Frequent inquiries are received by merchants for special goods not regularly carried in stock, and only those who are exceptionally well posted are in a position to give the desired information. With a view to meeting such requirements of the trade, "The Iron Age Index Supplement" is issued, giving, as our readers are aware, in the form of a directory or classified list, all the products of our advertisers, thus putting in the reach of the trade a mass of information not otherwise obtainable.

**SUGGESTIONS REQUESTED.**—A new edition of "The Iron Age Index Supplement" is now in preparation, and as it is issued for the convenience of our readers, we shall value any suggestions from the trade in regard to any improvement that can be made in its arrangement, so as to make it answer more perfectly the purpose for which it is intended.

**A HARDWARE MERCHANT'S LETTER.**—The following communication, from an enterprising Hardware merchant, may be of interest as suggesting some of the ways in which the Index may be used:

Your Classified Index of the products of advertisers in *The Iron Age* is of special value to those who desire information as to Iron, Hardware and Machinery. No one else supplies an equally complete directory covering information so often sought for in connection with manufacturers of Hardware, Machinery, &c.

#### The Ease

with which the information desired may be found can be best described by an illustration: Suppose you are looking for manufacturers of Surface Gauges. Turning to page 30 of the Index you find under the heading, "Gauges, Surface," that Athol Machine Company, Athol, Mass.; Hoggson & Pettis Mfg. Company, New Haven, Conn.; Sawyer Tool Company, Fitchburg, Mass.; L. S. Starrett Company, Athol, Mass., and J. Stevens Arms & Tool Company, Chicopee Falls, Mass., are manufacturers of these goods. The comprehensiveness of the Index, and the care with which it has been compiled, is well illustrated in this one line of goods, no less than 43 different kinds of Gauges being listed in connection with the names and addresses of the manufacturers. It may also be accepted as a vindication of the claim of the compilers that the Index contains some 6000 separate headings.

**"Who Makes Such a Line?"**

To the merchant a work of this sort opens the way to quick, intelligent selling of goods that years behind the counter may not give him. Time and again the question is asked, "Who makes such a line?" A correct and immediate reply brings almost invariably "Take my order for the goods," and, as a rule, without haggle as to price.

**Profitable Knowledge.**

With such a book on your desk you are an authority, or are looked upon as such. This class of man in a community is the successful merchant—the man who knows everything about his business—the one who secures the bulk of special, money making orders for goods.

**The Newest Productions**

also appear in this Classified List—Hydraulic Machinery, Electrical Machinery, Accumulators, Motors, Transmission—everything is there, and the simplest are as easily at hand. Turning to Aluminum you are given all of its producers, and if in want of Aluminum Bars, Castings, &c., the information also is supplied. Under the heading of "Bars" nearly 80 addresses of manufacturers of different classes of Bars are given.

An entire column is devoted to everything conceivable in the nature of Belting. Yet each particular part is so separated that in looking up the subject it is not possible for one to conflict with another. So, too, with Billets, Compressors, Machinery, Power Transmission, or simple Sash Lifts and Door Bolts; all complete yet all separate, and at hand.

**Any Merchant or Manufacturer**

is certainly at a loss without such a medium of information. Indeed, the pages of *The Iron Age* and its Index of Advertisers would seem a necessary part of his office outfit. The information he is so frequently at a loss for is at hand here, as it cannot be found elsewhere in such lines.

**Manufacturers Represented**

in this Classified List exceed a thousand in number, and all of them the very best. It would not seem consistent that any maker of goods of prominence at all would willingly miss representation in a journal to which nearly every one goes for information.

**Requests for Catalogues, &c.**

**B**EVEY has lately opened up in business at Mt. Morris, Ill., handling Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, &c. Mr. Avey would be pleased to have advertising matter from manufacturers and jobbers in these lines as well as Wire Cable and Steel Roofing.

F. F. MacNichol and Wm. McNaughton, under the style of F. F. MacNichol & Co., have opened a shop at Oshkosh, Wis., and will do all kinds of tin and sheet iron work and steam, hot water and hot air heating. They request copies of catalogues and price-lists from manufacturers and jobbers in goods pertaining to this class of work.

**Peerless Rubber Mfg. Company's Catalogue.**

**P**EEERLESS RUBBER MFG. COMPANY, 16 Warren street, New York, issue under date of March, 1900, catalogue No. 32. In it is shown a great variety of mechanical Rubber Goods of all kinds, including Packings, Gaskets, Hose and Hose Pipes, Belting, Tubing, Mallets, Diaphragms, Disks, Rolls, Hot Bags, Combination and Perforated Matting, Step Mats, Landing Pads, &c. The catalogue comprises 136 pages, is attractively printed in two colors and effectively represents the company's varied products.

**Death of John Alling.**

**J**OHN ALLING died at his home, 2207 Calumet avenue, Chicago, April 4, from pneumonia, after an illness of two days. He was one of Chicago's pioneer business men, and ranked as one of the oldest, if not the oldest Hardwareman in that city.

Mr. Alling was born at Madison, Ind., 72 years ago, and was 35 years old when in 1863 he began business in Chicago. He formed a partnership with John S. Buchanan, under the firm name of Buchanan, Alling & Co., the former conducting a Hardware business at 51 Lake street, which was then the leading retail street. In 1864 Mr. Buchanan sold his interest in the business to John A. Markley, the firm becoming Markley, Alling & Co. It remained unchanged until 1895, when the title became John Alling & Co. In 1898 Mr. Alling sold his business to Hibbard, Spencer, Bartlett & Co., retiring from active life at the same time. This business,



JOHN ALLING.

originally a retail one, grew into large importance with both wholesale and retail branches.

Before removing a year ago to his late residence he had lived for 30 years at 2131 Calumet avenue. Mr. Alling married Abby Culver of Wallingford, Conn., her death preceding his by exactly two months. He left three children, one son and two daughters.

Mr. Alling was a typical merchant of the old school. He dealt in high class goods, scorning the cheap catch-pennies and taking pride in seeking the best trade. His customers were therefore of rather a select class, who were bound to him by ties which could hardly be broken, certainly not by mere offers of lower priced merchandise. He was of a genial temperament, and loved a good story, but withal he was a man of strong convictions and a positive manner, frank in expressing his opinions and fearless of criticism. Wedded to business, he was always to be found at his desk, and after his retirement often expressed regret that he had been induced to sever his connection with active trade. Few men have had so large a list of warm friends, who will sincerely mourn his death.

The Hardware firm of Wickwire & Russell, Deposit, N. Y., have disposed of their business to a new firm, who will take possession June 1. The new firm comprise A. Seymour Wickwire, who has been connected with the old house for several years, James McGill and Fred. J. Radeker.

## Trade Winning Methods.

*This department will contain a description of approved methods of bringing customers to the store by means of newspaper advertising, circulars and such special expedients and methods as are found useful by enterprising and progressive Hardwaremen.*

*A cordial invitation is extended to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.*

### A MERCANTILE PARADE FLOAT.

THE float shown in the accompanying illustrations was prepared for and used in a mercantile parade by Geo. O. Hart & Son, Paducah, Ky. The mules

on the sides of the upper platform were made out of various kinds of Tools. The image was placed upon a large throne covered with red calico, with large galvanized hearts on each side and in the rear. The image in a sitting position was 10 feet high, and was built as



Fig. 1.—A Mercantile Parade Float.

were decorated with fancy colored covers with large stars of different colored goods about their necks, while

nearly to proper proportions in size as possible. It was made up of the following articles: The shoes were of Grocer Scoops and Stove Pans, the legs of Stove Pipe and the knees of Elbows. The body was constructed of two Galvanized tubs, the belt of Stove Pipe Flanges, the coat front of Wash Boards and the buttons of Biscuit Cutters. The shoulders consisted of Dish Pans, Wash Pans and Milk Pans with a necklace of Pint Cups. The neck was a 6-quart Bucket, while the head was made of Pie Pans and Milk Pans. The mouth was made of Pie Pans, mustache of Basting Spoons, cheeks of small Wash Pans and eyebrows of Patty Pans. The ears were half Pie Pans, the nose was a Thumb Scoop and the eyes Table Spoons. The shoulders were Grocer Scoops, the upper arm a Bucket, the lower arm Coffee Pot, and hands were small Grocer Scoops.

The King received a continual ovation from the time the parade started until it ended. After the carnival the firm had a great many callers from the surrounding country, who wished to examine the image closely.



Fig. 2.—King of Hearts.

the grooms wore clown costumes. The image mounted on the float was called "King of Hearts," and is shown more in detail in Fig. 2. The letters spelling these words

### ADVERTISING METHODS.

John B. Varick Company, Manchester, N. H., who are prominent Hardware merchants, adhere to the following general rules in their newspaper advertising, which is conducted with admirable enterprise and skill:

*Not to use exactly the same advertisement twice in succession.*

*Not to make any extravagant statements.*

*When possible use a cut of the article advertised.*

*To publish the selling price in plain figures.*

**SMALL CUTS.**—The company have tried various styles of advertising, but find the use of small pictures of goods brings the best results. The manner in which these are utilized is shown in the accompanying reproduction of

one of the company's advertisements. The cuts are obtained from various sources, some being drawn by one of their employees.

OCCASIONAL CHANGES.—The monotony which might result from the continual use of one style of advertising is relieved by introducing something different in the way

although English merchants are getting more prominence than they did a few years ago, and seem to be quietly cheapening and improving their machines. A fourth window, of Hollow Ware only, was solely English, nor, indeed, do you seem to have the slightest footing here in these goods. Germany competes in a small way in the cheaper lines, but the bulk of the trade is done by English firms.

CUTLERY AND SILVER WARE.—Cutlery and Electro-Plated Ware stocked here are English almost entirely, although one or two Solingen (Germany) firms have built up a steady little Australian trade in Cutlery within the past five years. Germany has certainly taught us that she can turn out good Cutlery as well as the cheaper lines, and the saying "made in Germany" no longer carries the same stigma which it did a few years ago.

PAINTS, OILS AND VARNISHES.—If America manufactures these lines she does nothing in the way of export to these colonies, yet there is no reason why, with good representation, a steady trade should not be built up.

IN HEAVY LINES, such as Wire Rope, Tubes and Fittings, Weigh Bridges, Earth Scoops, Dredges, &c., although American makes are in the market by far the bulk of the trade is with English makers whose representatives have been very active in past years.

IN LABOR SAVING TOOLS for carpenters and joiners, Garden Implements, Sanitary Fixings, Plumbers' Appliances, Rubber Goods, Files, Rasps, Slashers, Wrenches and the heavier lines of Stoves and Ranges, Mining Buckets, &c., there is room for increased trade with your country. In only one or two of the above lines your manufacturers have bestirred themselves of late, but taking American manufacturers all round, they do not go in for the same persistent representation (proportionately) that the English maker maintains.

AGENCIES.—Agencies "on commission only" will not work. I have no brief for manufacturers' agents, but I have seen so many good men attempt a living at it, and go down, that it is only in the American makers' own interests that I wish to point out that to build up a successful Australian trade they must employ a man who can give them full and adequate representation, and no man can do this in this country of great distances if, to make a living, he must carry round on one pair of shoulders the lines of half a hundred American interests. The success of many English makers has been made by two or three (only) of them (manufacturing goods which will not clash with each other) combining together to make it worth the while of a "live" man to work energetically in their interests.

FREIGHTS.—A heavy rise in freights throughout the world appears inevitable, unless (and this is hardly to be expected) there should be a sudden falling off in dead weight shipments. The mail boats from England to Australia are rumored to be contemplating an advance in freight rates, and this is not to be wondered at in face of the fact that to date some 220 steamers, with an aggregate tonnage of near 1,250,000 (equal to one-seventh of the English mercantile marine) are under charter to the British Government in connection with the Transvaal war. This, in connection with the rise in price of coal, and indeed every article of consumption, must necessarily create an upward movement in freights.

It is perhaps hardly safe to say how this is going to affect American trade out here. No doubt New York steamers will participate in the rise, but since heavy goods hardly offer so freely there as from London, and the boats need them for ballast purposes, the rise in English freights may possibly act as a bonus to the export trade in these lines if the present American service of direct steamers is regularly maintained. Doubtless your commission houses will take advantage of the opportunity.

ARTESIAN WELL BORING TUBES are safe to be in much greater demand in the near future, and the demand will be maintained. These colonies are subject to severe droughts, especially in the interior, and many hundreds

**JOHN B. VARICK CO.,** Varick Building,  
Manchester, N.H.

Product	Description	Price
Boys' Skates	The Union Club, best material, sizes 8 to 12. \$1.50, \$2.00 a pair.	\$1.50, \$2.00
Snow Shoes		
Whistler Exerciser		
Hockey Sticks		
Bowling	will make you well and strong.	\$2.00, \$3.00, \$4.00.
Boys' Skirts	Boys' Skirts, 50c., 10c., 20c.	50c., 10c., 20c.
Moccasins	Our own importation direct from St. Louis, Missouri & Co., Quality MOCASINS at low prices.	
Striking Bags	Special sale of about 50 pairs of Ladies' Head Shoes, worth \$1.00, at \$2.00 Pair.	\$2.00 Pair.
Gymnasium Clothing	Quarter Miles and Silver Crew Shirts, best Worsted.....\$1.25 Knee Tights.....\$1.50 Foot Tights.....\$2.00 White Gym Shirts, 50c. Horse Supporters, 35c.	\$1.25, \$1.50, \$2.00.
Baby Sleighs	Precious upholstered and finely finished.	\$4. 55.50, \$7. 10.50
Double Runners	We have about a dozen extra size and strong Double Runners. We offer them at \$10.00 Each.	\$10.00 Each.
Sweaters		
Indian Clubs		
Girls' Skirts		

of reference to local or current events, with appropriate illustrations. Such advertisements usually have a vein of humor running through them, and amuse and interest people, and so get them in the habit of looking for the company's announcements.

ADVERTISING AND WINDOW DISPLAYS.—The company consider good advertising and attractive window display equally important, and insist that neither should be neglected in endeavoring to secure business.

### Australian Letter.

FROM A SPECIAL CORRESPONDENT.

A WALK along the main streets here in Melbourne, say Elizabeth, Bourke and Swanston streets, where ironmongers congregate, would be instructive to your American factors. Little need to go inside to make inquiries; the windows tell their own tale. Street displays of goods, which I noticed an *Iron Age* correspondent recently advocating, are here prohibited by municipal law.

LAMPS.—In one window I noticed, the whole space was given up to Lamps, wherein American goods certainly preponderated. In that line your country certainly has its fair and full share of popular favor here, especially that of Edward Miller & Co. of Meriden, Conn. American Lamp makers, too, pack better than their English brethren.

BRASS AND BRONZE GOODS.—In Brass Foundry windows there is a different tale to tell, and English manufacturers take the lead. The patterns are more diversified than the Americans, and have a greater appearance of solidity and strength in such lines as Cabinet and Fancy Brass Work, and also in Lock Furniture. I saw some remarkably cheap American Locks, but they lack the finish of the British make. They were doubtless good value for the money, but this market is not to be captured in that manner. In Steam Cocks and Gauges you can more than hold your own.

KITCHEN UTENSILS.—In domestic lines, such as Meat Choppers, Polishing Irons, Raisin Seeders, Sausage Machines, &c., your goods occupied most of a third window,

of square miles have been rendered useful for stock and sheep raising solely by artesian bores.

The New South Wales Minister for Lands, backed up by a majority of the Parliamentary members, is going to recommend the Cabinet to place £250,000 on the next loan estimates for artesian boring. So far the bulk of these Tubes have been supplied by two or three of the leading British makers.

### A Merchant's Grumblings About Manufacturers' Methods.

THE spirit that prevails in many, if not most, factory offices regarding acknowledging orders and giving information as to the probable shipment of the goods is one that would bear improvement.

The writer had eight years' experience in the offices of two large factories before he went into a store, so thinks he is somewhat qualified to speak of this matter from the two standpoints.

#### Delay in Shipping.

The orders generally sent to a factory are for immediate shipment. The dealer waits the usual time, and is surprised to hear nothing from his order. He begins to watch the mails, hoping the next one to arrive will bring him advice of the shipment. His stock is exhausted; he has calls for the goods, and is obliged to put off his customers with generalities.

By this time his patience has reached its limit, and he sends a postal asking why his order is not filled. This is answered by a card that says, "We hope to ship the goods very soon." He knows just as much then as he did before. "Soon" may mean three days or three weeks. He not only loses sales from not having the goods, but also from the fact that he cannot promise that he will have them at a definite time. It seems to him that the manufacturer might very easily have promptly acknowledged the receipt of his order, and at the same time have said when the goods would be shipped.

#### A Buyer's Habit.

It is the habit of most of us when we are sending an order to some certain house to look over the full line of goods that we buy from it, and make our order as comprehensive as we can. Probably we are nearly out of some things, while in others we are so well stocked we would not think of replenishing for some time to come, yet so long as we are sending the house an order we think we might as well add a few of these goods also.

After we have waited, and waited, and waited some more, we finally write an energetic protest at the delay, and are then informed that the goods we most urgently need are ready, but they are being held for the goods of which we already have a fair stock in hand.

Many of us have been caught in this way so often that if we order several items, some of which we need at once, and others that are fairly well stocked, we mention this, and beg that the needed goods shall not be held back, but it is by no means seldom that we receive a bill for the goods we are in no immediate need of, and are told that those we specially made the order for are put on the back order book.

#### An Annoying Incident.

Last November I needed some Knives running from 5 to 12 inches. I wrote the manufacturer that I was entirely out of 6, 6½ and 7 inch blades, and if he could push them through first to do so and ship at once without waiting for the others, which could be sent later.

About the middle of December I received an invoice, and found every size there that I ordered except the three that I had written them I needed the most. A vigorous inquiry was made as to why this was so, and I was informed that the concern ran short of stock, so were obliged to send the other sizes later; and these were sent me January 15, when the season was over.

#### The Posted Manufacturer.

The manufacturer who knows the A B C of his business can give an estimate any day that he receives an order as to the time the goods can be shipped. The matter being in his own hands he can make due allowance for contingencies and name a day that is in his own favor. With this date before the dealer he knows exactly what to say to a customer, and in nine cases out of ten the average customer will wait if a specified date is named to him.

But it is seldom that we get assistance of this kind, and we are obliged to see our trade turn away.

#### Aggravations.

I have written as if all our letters that are meant to hurry forward goods were promptly answered, but this is far from being the rule. With a good many concerns, and they are by no means the small concerns either, no answer is returned to our letter. We watch the mails for the information that does not come, and probably send another vigorous epistle. By and by the invoice comes to us and we are left to our own explanations.

This course is so unnecessarily irritating, so boorish and unbusinesslike, that one wonders what the ideas are in the offices where it is practiced. But I think every merchant who reads this has had just such experience.

In the middle of December I ordered three numbers of an article from a Connecticut factory, saying I needed the three most urgently. On January 3 I received one of the numbers by express, with a bill, but not a word as to the other two. In paying the bill on January 10 I inquired about the two that were not sent. On the 13th I received a receipt for my remittance, but not a word about the goods. On the 15th I wrote again, but though 11 days have passed I am as much in the dark about the balance of my order as I was a month ago.

#### Unnecessary Splitting of Orders.

Then there is the unnecessary splitting up of orders. The story of my experience with the Knives as told above is a case in point. Had the manufacturer written me that he could send part of the order at once, but would be about so long in filling it complete, I would have written him to hold what he had until the rest was ready. He would do this if he studied my interest to any slight degree, but he does not. By pushing along all he can he gets his pay for this part so much sooner, and gets those goods out of his storehouse.

#### Freight Charges.

In making an order, as freight from New England to my town is quite an item, I often see that the shipment is for full 100 pounds, as the minimum charge is made for this amount, even if the box should weigh but 10. You may imagine my feelings when I find the order divided into two shipments, and I have to pay the full charge on each. A postal card from the factory office telling me the conditions, and the time needed to make the shipment complete, would enable me to head off this foolish shipping clerk, and accomplish the saving that I set out to make when I sent the order.

Not long ago I saw that my stock of a certain good selling implement was running low and I started to order a gross. Then I remembered that a gross weighed only 50 pounds, so I made my order read two gross. You can appreciate my feelings when I received an invoice for one gross, with a line at the bottom telling me the other gross would be forwarded in a few days.

#### Express Charges.

Then take up the matter of express charges. *The Iron Age* has done good service in calling attention to the burden the express companies place upon business men by their exorbitant charges, but did you ever think of the immense sum that is needlessly paid these companies annually?

In the large factories the shipping clerk hardly ever sees a freight bill. In the two factories where the writer

worked the express agent brought his memorandum of charges to the office on the first of every month, and this was paid in a lump sum, and no one knew if it was correct, or what rate was charged, or any detail whatever about it.

In such shops it is not to be wondered at that clerks send large boxes by express, because the man ordering said to get them off as quickly as possible. Two-thirds of the shipping clerks imagine that an express package goes anywhere for 25 cents, no matter what it is or what it weighs. You, Mr. Editor, in preparing yourself to discuss the express business learned that express rates are extortionate.

#### Express vs. Fast Freight.

I pay \$2.50 for 100 pounds from New York to my store, and \$3.50 when the goods come from New England, while the same weight by fast freight is 50 cents. The express company will bring the goods in 36 hours, and the fast freight line in 72 hours. I do not want to do business for the sake of paying express charges. It is exceedingly seldom that I want goods sent me by express, and when I do I am entirely able to say so.

But almost every week I am called upon to pay for goods being sent by express that were not so ordered, and that would have come in satisfactory season if sent by fast freight. One does not want to get the reputation of being small, or of being a "kicker," and often permits this thing to pass, saying to himself he will see that no loophole is left in his orders to permit its repetition in the future; but in spite of his care he has to continue paying tribute to the express companies.

#### Goods Sent Out to Pack.

What merchant is there who has not been caught in a trap with the goods he asked one house to carry into another house to be packed? The goods most wanted are sure to be sent in too late; while the things that were ordered just to make a shipment come along at the highest speed. And in almost every instance the package that was too late to get into the case is sent sailing along by express.

#### An Aggregation of Trifles.

These are all trifling things, but business, yes, life itself, is made up of trifles. If every man would put himself in his customer's place he would see at once that the customer wanted either a bill of the goods he had ordered, or information as to the date of shipment. Also that his goods came to him always by the ordinary way, unless specially directed to the contrary, and that an order should not be divided unless the customer was first advised and had agreed to it. A good many words can be written on a penny postal card, and Uncle Sam's mail service is speedy and tolerably reliable.

If the manufacturer and jobber will promptly acknowledge an order, and post the retailer fully as to any delayed shipment, the retailer will make his promises with confidence to his customer, and feel that he is doing business in an intelligent way, instead of stumbling in the dark. This is worth striving for.

#### Boston Belting Company's Catalogue.

BOSTON BELTING COMPANY 256-260 Devonshire street, Boston, Mass., have just issued a booklet entitled, "Do You Know?" At the head of each page is the word "That," followed by information in regard to their products, as, for example, on the first page, by the statement that their business, established in 1828, is the original and oldest manufacturing Vulcanized Rubber Goods. On subsequent pages, in alphabetical order, their goods are indicated, and at the bottom of each page is the reminder "When its anything about Rubber—ask us." The pamphlet is attractively printed.

NORTHAMPTON CUTLERY COMPANY, Northampton, Mass., manufacturers of fine Table Cutlery, have moved their New York office from 96 Reade street to the Graham Building, 127 Duane street, corner of Church street.

## Letters from the Trade.

*Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.*

#### Rusting of Nails.

Referring to the question as to the durability of Nails which are exposed to the weather we have the following communication from a Boston house, who have given a good deal of attention to the matter:

Our experience is that Steel Cut Nails are quite as bad as Steel Wire Nails, and they are produced by the same process, so that the free acid remaining in them is acted upon by the atmosphere and quickly destroys the nails. We have had our attention repeatedly called to this in case of Shingling, but not until recently have we heard the same story with regard to Slate Nails.

We have in our office samples of both Cut and Wire Nails of Steel, which have been rusted to utter worthlessness within two years.

#### Prepaying Foreign Postage.

The following communication from a well-known English house explains itself and calls attention to a neglect in foreign correspondence which a little care would rectify:

Some time ago we noticed a letter in your journal calling attention to the slack way in which the postages were prepaid on American letters. May we confirm this experience? We unfortunately have to pay considerable sums on excess postage of each delivery of our American mails. This week we have had to pay the following items on various letters:

	s. d.
One letter at.....	10
Three letters each at 5d. equals.....	1 3
One letter at.....	2½
Total .....	2 3½

We do not object very much to the items themselves, but it is very tiresome to have to pay for other people's correspondence, particularly when we know this can be obviated by a little care. We believe it is entirely due to want of care, and when we say that one of our correspondents was a New York bank, on whose letter we had to pay excess postage, we think this statement will be fully borne out.

#### Price-Lists, Circulars, &c.

UNION HARDWARE COMPANY, Torrington, Conn.; Tower & Lyon, 95 Chambers street, New York, direct representatives: Illustrated catalogue of Roller Skates, showing eight new styles in addition to their regular line.

HENRY B. NEWHALL, 26 Cortlandt street, New York: Illustrated catalogue No. 40, showing the Coburn Trolley Track and Ball Bearing Hangers for house, barn, pier, elevator and fire doors, Fire Door Hardware, Rolling Ladders and Carrying Track Systems.

CHICAGO SCALE COMPANY, Chicago, Ill.: Circulars showing New Jewel, New Columbia and other Sewing Machines, Champion Fire Proof Safe, United States Standard Scales, &c.

THE CENTRAL STAMPING COMPANY, 25 Cliff street, New York, issue a compact illustrated catalogue of 237 pages of the goods they manufacture. It is subdivided into sections A to S, inclusive, and includes Deep and Shallow Stamped Ware, Tinnings' Trimmings, Sieves, Spoons, Japanned Ware Trays, Pieced Tinware, United States Heavy Polished and Planished Ware, Britannia Goods, Copper and Brass Goods, Nickel Plated Ware, &c.

THE SPALDING ST. LAWRENCE BOAT COMPANY, Ogdensburg, N. Y.: Two booklets of their products, one illustrating Wood and Canvas Paddling Canoes, the other describing Hollow Masts and Spars for yachts and sailboats.

**GEORGE DELKER COMPANY**, Henderson, Ky.: Illustrated catalogue of Carriages for the wholesale trade. Among the styles shown is a large line of Buggies, Driving Wagons, Phaetons, Traps, Top Carriages, Surreys, Drummers' Wagons, &c.

**CLIMAX ROAD MACHINE COMPANY**, Marathon, N. Y.: Illustrated catalogue of Road Making Machinery, including Road Machines, Stone Crushers, Elevators, Screens, Engines, Road Rollers, Bridges, Distributing Wagons, &c.

### The Standard Screw Company.

**A CONSOLIDATION** of leading manufacturers of Machine Screws has been affected under the name of the Standard Screw Company. The companies concerned in it are the Worcester Machine Screw Company, Worcester, Mass.; Chicago Screw Company, Chicago; Detroit Machine Screw Company, Detroit, together with the Westerman Company of Lockport, N. Y., who operate rolling mills. The Standard Screw Company have been incorporated under the laws of New Jersey with a capital stock of \$1,500,000, all of one class. The officers are C. E. Roberts, Chicago, president; A. W. Gifford, Worcester, vice-president; George Trall, Detroit, secretary, and C. M. Rawlins, Chicago, treasurer. The object of the consolidation is to give advantageous manufacturing opportunities rather than any advance in prices.

### The American Appraisal Company.

**THE AMERICAN APPRAISAL COMPANY**, Milwaukee, Wis., whose New York office is at 804 Park Row Building, were organized four years ago for the purpose of furnishing to owners of plants the exact value of the same. The Appraisal consists of an invoice and inventory with full plans, showing all elevations, excavations and the entire assembling of material which constitutes the plant. Upon the plans the locations of all buildings are exhibited, and the invoice shows all machinery, shafting, pipe and fitting and miscellaneous articles of every kind whatsoever contained in and forming part of the possession. The entire work is so classified, arranged and indexed that any part or portion of the estimate may be easily found and the value determined. The inventory is an exact duplicate of the invoice without prices. All of the plans are made from original drawings by expert architects and draftsmen, showing cross sections, elevations and floor plans of each and every building composing the plant, also mode of construction and the location of all power driven machinery, shafting, belting, &c. The work is so arranged that it can be easily corrected from time to time as additions and deductions are made, so that it continually exhibits the exact value of the plant.

The convenience of the volumes, invoice and inventory is for the purpose of enabling the property owners to properly distribute insurance, and to arrive at a complete and accurate basis for all financial transactions wherein the value of the property is involved and for many other purposes obvious to property owners.

The American Appraisal Company are the originators of this commercial convenience, and emphasize the fact that under the direction of experts their work is of the highest quality. In this connection the company issue a prospectus, in which they describe at length the character of their business, and give over a hundred references in upward of 40 different lines of business, a large proportion of which are letters in *fac-simile* from concerns with a national reputation.

### Trade Items.

**PIKE MFG. COMPANY**, Pike Station, N. H., and 151 Chambers street, New York, have prepared a very handsome exhibit for the Paris Exposition. The exhibit cleverly utilizes the goods manufactured by the company for decorative as well as constructive features. Among the unique features of the exhibit will be the largest Oil Stone in the world, consisting of a solid piece of Washita stone, 4 feet long by 8 inches wide and 6 inches thick, weighing 205 pounds, and valued at \$250.

**THE IOWA FARMING TOOL COMPANY**, Fort Madison, Iowa, have issued for the use of merchants who handle the goods a series of folders relating to their manufacturers. These folders are gotten up in artistic and attractive style and illustrate, and give something of a description of the goods. The title page is suggestive of the contents of each folder. Some of the goods covered by the folders are Sugar Beet Hoes, Vegetable Forks,

Stable Forks, Mortar and Street Cleaning Hoes, Cultivator Hoes, &c.

**STANLEY WORKS**, 79 Chambers street, New York, manufacturers of all kinds of Hinges, have a limited number of their 1900 calendar undistributed, which they will take pleasure in sending to Hardware retailers who first make application for them. The calendar is beautifully illuminated, and represents a young lady late at morning service entering church unobserved because the doors are hung with Stanley's Noiseless Ball Bearing Butts.

**GEORGE P. BENJAMIN**, dealer in almost everything in the way of utensils for the kitchen, such as Wire Goods, Tinware, Enamelled Ware and Hardware Specialties, will about May 1 move from his present quarters at 104 Chambers street, New York, where he has been for 18 years, to much more commodious quarters in the Market and Fulton National Bank Building, 81-83 Fulton street, corner Gold. This is a fine modern building with all improvements.

**GRAY & DUDLEY HARDWARE COMPANY**, Nashville, Tenn., issue an attractive booklet tastefully gotten up, entitled "Our Brands," in which attention is called to a number of special goods carrying their private brands, and which they refer to as sold on honor. They also emphasize the quality of their goods, and others which they sell. The pamphlet is carefully compiled and interesting, and is attractively and artistically printed.

**H. D. SMITH & CO.**, Plantsville, Conn., manufacturers of vehicle and special drop forgings, established in 1850, have opened a New York office in the Postal Telegraph Building, 253 Broadway, where samples of their product may be seen. This company have recently been reorganized and are now under an entirely new management. Their S in a circle brand of Carriage and other Forgings is widely known. W. D. Walkley, the vice-president of the company, and formerly of the Peck, Stow & Wilcox Company, will be in charge of this office, and associated with him will be L. H. Schmitt, who also for many years has been identified with the Peck, Stow & Wilcox Company. In addition to their line of Carriage Forgings, which are favorably known, the company call particular attention to their facilities for making high grade Drop Forgings for Automobiles, Bicycles, Typewriters, Sewing Machines, &c., and correspondence in relation to such work is solicited.

**GEO. WHITMORE CARR & SON** is the name of a new firm recently located at 11-13 William street, New York. They will execute orders on commission for American manufactured goods for export, principally to the River Plate country, Brazil, South Africa and a little to Europe, in such goods as Metals, Machinery, Hardware, Lumber and kindred lines. They also hope to represent some American manufacturers abroad. The senior partner will be remembered as the head of the old house of Carr & Hobson, who began business in 1872 and were incorporated in 1880, their business being largely the export of Agricultural Implements. For the past five years G. W. Carr has been connected with the export house of Cadernas & Coe, New York.

### Among the Hardware Trade.

William E. Adams has succeeded Adams & Spellersburg in the retail Hardware, Stove and Sporting Goods business at Garden Grove, Iowa.

Sadler & Murta have dissolved partnership in the Hardware business at Fort Smith, Ark., and F. Murta has succeeded under his own name.

W. H. Wadsworth is carrying on the business formerly conducted under the style of Indianola Hardware, Implement & Furniture Company, Indianola, Neb. Mr. Wadsworth is now occupying the new quarters necessitated by the burning out of the old store in October last.

Love & Powell are successors to Ball & Co., Hardware, Stove & Agricultural Implement merchants, Akron, Ind.

The Bridge Hardware Company, as successors to Bridge & Nicholls, East Jordan, Mich., have been incorporated with a capital stock of \$5000. They are continuing at the old stand.

John Over, Leonore, Ill., whose store was destroyed by fire several weeks since, has rented another stand and resumed business.

Kloster Bros. have succeeded Colton & Kloster at Hatton, N. D.

W. C. Grisdale & Co.'s Hardware store, Bay City, Mich., was destroyed by fire a short time since. They are rebuilding on the old site.

The Cosgrove Company, Le Sueur, Minn., were incorporated on the 2d inst., as successors to the firms of J. R. S. Cosgrove, Hardware, Farm Machinery, Furnaces, Plumbing, &c., and Cosgrove Live Stock Company. The new company have assumed all the obligations and contracts of the two firms, and neither the lines of business nor the management of the old firms have been changed in any way. The directors of the company are J. R. S. Cosgrove, president; C. N. Cosgrove, vice-president; Robert H. Cosgrove, secretary and treasurer, and Lewis C. Cosgrove.

C. C. Crawford & Co. is the style of a firm who have lately opened up in the Hardware, Stove and Plumbing business at Areata, Cal.

The A. B. Carr stock of Hardware, at Bryan, Texas, has been sold to Cole Bros.

C. Surgines has succeeded to the business formerly conducted by Surgines & Miller, Floydada, Texas.

R. H. Herron Company, Los Angeles, Cal., have incorporated with a capital stock of \$100,000, to carry on the wholesale and retail business in Hardware, Stoves, Agricultural Implements, Oil Well Supplies, Sporting Goods, &c. The company have branch houses at Bakersfield, Hanford and Coalinga, and an office at 303 Bush street, San Francisco.

Dunbar & Jenson have succeeded F. O. Dunbar in the Hardware business at Lake Preston, N. D.

McGill & Conard have succeeded E. B. Stewart & Co., Gilbert Station, Iowa.

F. S. Reynolds have purchased the interest of S. W. Chambers in the firm of Chambers & Co., Vernon, B. C., and will continue the business under the style of Vernon Hardware Company.

W. A. Talmage, Red Lodge, Mont., who reports business better than in any previous year, has been remodeling and rearranging the interior of his store, and has added a number of new fixtures for the display and accommodation of his stock.

G. Boswell has retired from the management of the Boswell Hardware & Implement Company, Coffeyville, Kan., wholesale and retail dealers, and has been succeeded by A. L. Wagstaff, a member of the corporation.

Westover, Stevens & Brown have succeeded Riverside Hardware Company, Everett, Wash.

Hill Bros., Hiawatha, Kan., have disposed of their business to J. C. and R. T. Ambrose, who will continue under the style of Ambrose Bros.

Woodward & Ober have opened up in the retail Hardware, Agricultural Implement and Sporting Goods business at Beverly, Mass. They have installed a number of the Jno. D. Warren Mfg. Company's store fixtures.

Schoeder & Wagner have succeeded F. W. Schroeder, Archer, Neb. The firm are now at work on a new building, to which they will remove on completion.

Newberry Hardware Company, with a capital stock of \$10,000, have succeeded F. A. Schumpert in the Hardware and Farm and General Machinery business at Newberry, S. C. The officers of the corporation are Walter W. Watt, president; Samuel J. Wooten, vice-president, and Fred A. Schumpert, secretary and treasurer.

W. W. Hough's Hardware store in Mound City, Ill., was destroyed by fire several weeks since. Mr. Hough will rebuild in brick and Steel.

J. B. Fuller & Co. have removed their stock of Hardware from Westcott to Comstock, Neb.

Samuel Pointer has purchased the interest of Henry Pointer in the Hardware, Farm Implement and grocery business in Franklin, Tenn., but the style, Pointer & Co., continues unchanged.

P. S. Morton has sold out his Hardware business at Clarion, Iowa, to Geo. L. Mechem.

The Malone Hardware Company, Waxahachie, Texas, have been incorporated with a capital stock of \$10,000. They will conduct a wholesale and retail business in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements and Vehicles.

William T. Linney has purchased the Hardware business of David Ostrum, at Fort Plain, N. Y. Mr. Linney has been identified with the store for the past 11 years.

P. Moran & Co., formerly of Genoa, Neb., have removed to Dougherty, Iowa., where they have engaged in the Hardware, Stove, Tinware and Furniture business.

The firm of McKnight & Russell, Brainard, Neb., have dissolved, and E. A. McKnight & Co. have succeeded at the old stand.

L. H. Cross, Baxter Springs, Kansas, has lately opened up with a new stock of Hardware, Farm Implements, Stoves, Furniture, &c.

C. H. Russell & Co., Champaign, Ill., have put a new and attractive front on their store, adding greatly to its exterior appearance.

Leonhard Klatt has sold out his business at North Greenfield, Wis.

John Warr, vice-president and manager of the Montana Hardware Company, Lewistown, Mont., has sold out his interest in the business to his son, Austin Warr, who has succeeded him as vice-president. G. J. Wedeman has been appointed manager. The business in all other respects continues as heretofore.

H. C. Hupe, Bellflower, Mo., has admitted a partner, and the style has become Hupe & Clare.

Hoover & Witmer, Newville, Pa., have been succeeded by G. W. Hoover.

The store of W. H. Horton, Lyndonville, N. Y., was recently destroyed by fire.

The store of C. M. Wheeler, Fulton, Ill., has been disposed of to Naniga Bros., who will continue at the old stand.

Jacob Gehrig, Jr., has succeeded F. H. Dauderman in the Hardware and Farm Implement business at Alhambra, Ill.

H. H. Rawlings has disposed of his interest in the business of Rawlings Bros., Wakefield, Neb., to his brother, Thomas Rawlings, who will continue under his own name. H. H. Rawlings has removed to Spokane, Wash.

Donovan-McCormick Company have succeeded Donovan & Spear, Billings, Mont., wholesalers and retailers of Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c. The company expect to erect a large store for department purposes.

J. P. Laire & Co., Plainfield, N. J., have disposed of their business to H. E. Gayle, who will continue under the style of H. E. Gayle Hardware Company. The line of goods carried comprises Hardware and House Furnishings.

The store of J. T. Lane & Sons, Welden, Iowa, was recently burned out. The stock was a total loss.

O. E. Carlton has purchased the Hardware and Stove business of E. D. Sherman, Le Roy, Iowa. Mr. Carlton is intending to make a number of improvements in the store.

Chas. D. Miner, Wallingford, Vt., has removed to larger and more commodious quarters.

The firms of Becker & Main and L. P. Smith, Camden, N. Y., have been consolidated by the retirement of Mr. Main and the removal of the stock formerly owned by Mr. Smith to the Becker & Main store, which is undergoing extensive repairs. The style of the new firm is Smith & Becker.

Uyland Bros. have succeeded L. H. Uyland at Knox, N. D.

M. Inholder's store at Pierce, Neb., was robbed on the 16th ult. of \$300 worth of Cutlery, &c. No clue has yet been obtained to the thieves.

**American Mfg. Company.**

American Mfg. Company, Chattanooga, Tenn., manufacturers of harness and builders' hardware specialties, are now putting on the market their 1900 Perfection steel gate latch and 1900 roller bearing hinge, on which patents have been applied for. Their first shipment of the goods was made on the 5th inst. The articles are referred to as having been brought to the attention of but few houses thus far, by whom they have been regarded very favorably.

**The Gem Nutmeg Grater.**

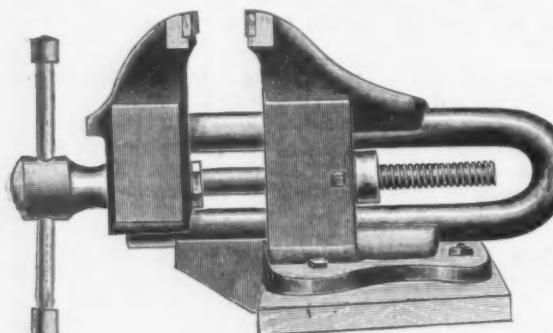
The accompanying cut illustrates a nutmeg grater offered by the Caldwell Mfg. Company, Rochester, N. Y. The tin grater plate is stationary on the larger handle,

*The Gem Nutmeg Grater.*

shown at the right hand side of the illustration. In use the nutmeg is placed in the cup, and the grating can be regulated, fast or slow, by the amount of pressure put upon the crank as it is revolved. The grating is continuous, very few turns sufficing for ordinary use. There are no springs used in the construction of the grater. The metal parts are nickel plated, and the handles are finished in black enamel. A display easel of wood, finished in ebony, arranged to accommodate six graters, is furnished with the first order for the goods.

**The Ware Steel Yoke Vise.**

The cut shown herewith represents a new vise put on the market by J. L. Ware, St. Anthony Park, St. Paul, Minn. In construction both jaws are cast around a yoke of solid steel shafting. At the same time the hole is cast for the vise screw and nut. The point is made that the yoke has great strength and durability, as only the best machine steel shafting is used for this purpose. The yoke is so narrow, it is explained, that it makes the

*The Ware Steel Yoke Vise.*

space between the jaws roomy, for all kinds of work. In the vise with 5-inch jaws the yoke is of 1½-inch steel shafting, the vise weighing 90 pounds. It is thus shown that the greater part of the width of the jaw is available for long perpendicular work. The vise is provided with steel jaws, and all its special features, it is stated, are secured by letters patent now pending.

**The Sterling Slicer.**

N. R. Streeter & Co., Rochester, N. Y., are offering the vegetable and fruit slicer shown in the accompanying cut. The blade is referred to as being of tempered knife steel and as being so protected that only by gross carelessness can operators cut themselves. A pusher is provided to feed the article to be cut, but at the start, for a long cucumber, it can be thrown back out of the way, although still remaining attached to the machine. The slicer clamps securely to the table, and by a turn of a thumb nut allows the disk and knife to separate

*The Sterling Slicer.*

from each other and from the body for washing or brushing. The machine, it is stated, will slice any fruit or vegetable, in thickness from that of a card to ½ inch, also that it will cut in squares. Each rotation of the disk makes two cuts and the food drops into a plate or pan below. It is pointed out that there is no waste, the last slice being the same thickness as the first, and that the adjustment for making the slices thick or thin is very simple.

**Diamond Expansion Bolt and Shield.**

New Jersey Foundry & Machine Company, 26 Cortlandt street, New York, have recently put on the market a modification of the Diamond expansion bolt and shield, as shown in the accompanying illustration. The newer sizes are made to take 3-16 and ¼ inch brass or iron screws, and are especially adapted for sanitary plumbing work, fastening basins, &c., to marble, stone, brick or metal, outside signs, soda water fountains, door jambs,

*Diamond Expansion Bolt and Shield.*

lock and hasp work, repairing, &c. In addition to the style shown, they can be furnished with a variety of heads, such as hanger screw, eye bolt, prison bolt, round, cap and other heads, with rings or hooks, or for almost any purpose to hold work to stone or metal, whether in small or large sizes. The hardware dealer can carry the shields only and supply regular screws from his own stock. This method of fastening is designed to supply a quick and efficient substitute for wood and lead plugs, split bolts and wedges, &c., and at a price commercially attractive. This company also make the shields as heretofore for bolts, lag screws, &c., in 5-16, ¾, ½, ⅓, ⅔, ⅕ and 1¼ inch diameters, all lengths.

### Extension Rink Roller Skates.

Union Hardware Company, Torrington, Conn., for whom Tower & Lyon, 95 Chambers street, New York, are direct representatives, have just issued a new roller skate booklet, in which, added to former popular patterns, are a number of new styles, two of which are here illustrated. Both of these skates can be made to

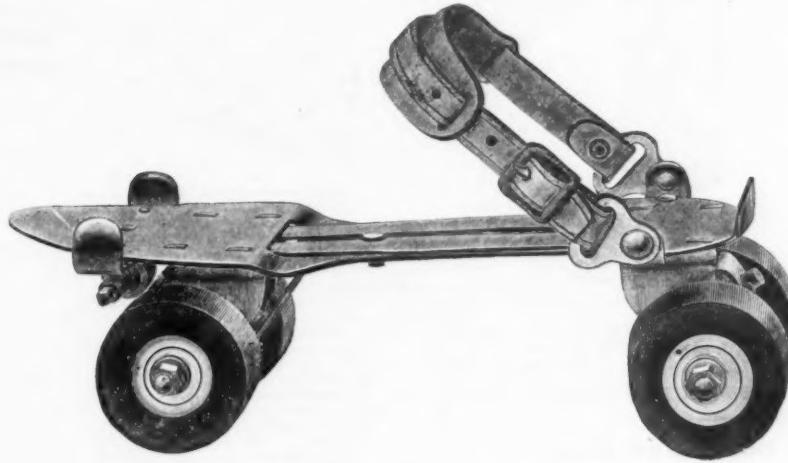
when the wire is laid to one side so as to wind on the bar, as shown in the cut, when two or three turns of the reel are given to stretch it. It is explained that the arms of a reel allow of enough leverage to enable one to break the wire, so it is possible to stretch it as tight as desired. The stick is placed across the arms of the reel, as shown in the cut, to hold the tension, and the wire is stapled to the posts. The manufacturer states



*Fig. 1.—All Clamp Extension Rink Roller Skate.*

fit any shoe as small as 8½ inches long and up to 11½ inches for the all clamp, Fig. 1, and 10½ inches for the half clamp, Fig. 2. The adjustment is easily made and the parts are firmly held. The tops, trucks, clamps and stampings are made of the best cold rolled Swedish steel. The trucks oscillate, are fitted with best rubber cushions and will turn in a 3-foot circle. The rolls are made of Hemacite, a very hard and tough composition, black in

that the frame obviates carrying the reel of wire, that it stretches it in the simplest manner without injuring the wire and in the shortest space of time, that there are no ratchets or mechanism to get out of order, that wire can often be put on posts in less time than it would take to cut a path wide enough for two men to carry a spool of wire for unreeling, that for long stretches with a pony hitched to the end of the wire and a boy to ride



*Fig. 2.—Half Clamp Extension Rink Roller Skate.*

color. The style seen in Fig. 1 is made in No. 9 bright finish, No. 9½ nickel finish, with plain bearings, and with ball bearings, as in Fig. 2, in No. 7 nickelized and No. 7½ full polished and nickelized. In Fig. 2 is shown the half clamp extension rink roller skate for girls and ladies. The straps are russet grain leather, with nickelized buckles and trimmings. No. 10 is bright finish, No. 10½ nickelized, both with plain bearings, as in Fig. 1. No. 8 is nickelized and No. 8½ full polished and nickelized, both with ball bearings, as in Fig. 2. When renewing the rolls of the ball bearing skates the entire bearing is transferred bodily to the new roll.

an entire spool can be unwound in the worst of places, that the frame will be found convenient for taking wire from a fence and rewinding on a spool, the wire being wound evenly in this way and trash excluded, and that

### The Barb Wire Fence Builder.

The barb wire fence builder here shown is offered by V. Schmelz, Sylvan Lake, Fla. The builder is referred to as made of strictly first-class all heart yellow pine, bolted together and well bound with iron straps. It weighs complete with rod and brace about 30 pounds. The frame is not painted, but varnished, it is explained, to show the quality of material. It is 5½ feet by 22 inches in size, and is designed for fence up to 4 feet in height. In operation the frame is placed as shown in the cut, one side resting against the corner post, while the other is supported by the brace, which slips on a pin provided at either side of the frame. The bar is passed through the reel of wire and placed on the frame at the height desired to stretch the wire. The end of the wire is wrapped around a hammer or a stick, which being held behind the operator, is carried to the end of the fence and fastened. The point is made that the wood bearings will not allow the wire to unreel too fast. To stretch the wire the slack is rewound on the spool,



*The Barb Wire Fence Builder.*

the frame provides an excellent method of stretching wire over water.

The Hardware store of J. M. Doherty, Coleman, Mich., was destroyed by fire on the 5th ult. The loss was \$2000, with insurance of \$2200. Mr. Doherty has since put in a \$4000 stock, and is now prosecuting business as usual.

### Fairfield Design Store Door Lock.

The Norwalk Lock Company, South Norwalk, Conn., are putting on the market a new design of store door lock, as shown in the accompanying cut. It is of cast bronze and is made for both flat and rabbeted front doors. The locks are furnished in antique copper, an-

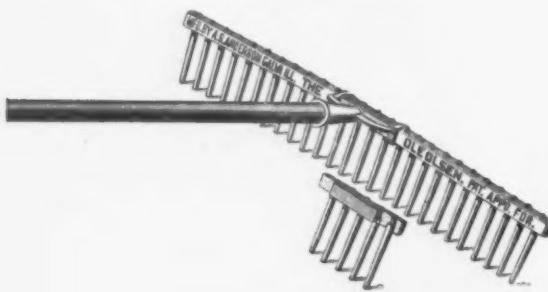


*Fairfield Design Store Door Lock.*

tique copper, sand finish, and in antique brass. A number of other articles are made by the company in the same design, including escutcheons, key plates, door knobs, electric bell pushes, door pulls and sash lifts.

### The Ole Olsen Lawn Rake.

C. M. Avery & Co., Chicago, Ill., are selling agents for the United States for the lawn rake herewith illustrated, which is manufactured by A. S. Anderson, Galva, Ill. It is a wooden rake with a malleable ferrule connecting the head with the handle. The head is curved and thus admits, it is explained, of only four to six teeth coming in contact with the surface of the lawn, the teeth on either side of the center performing their work perfectly, without touching or tearing up the lawn. It is



*The Ole Olsen Lawn Rake.*

pointed out that this feature procures light draft, and that the head being curved, in raking throws the material toward the center of the rake and makes it easy to handle. The teeth are referred to as being close set and clinched, as shown in the smaller cut. The teeth are made of extra selected stock, it is stated, and so constructed that when driven into the head they will never shrink from place and cannot fall out. Attention is directed to the fact that the teeth have an even taper and in use acquire a high polish; that they cannot bend,

and therefore will not clog and bind like a metal tooth. The handles, head and teeth are said to be made from well seasoned, straight grained hard wood, and are oil finished.

Barker Hardware Company, Bristol, Tenn., have been incorporated with a capital stock of \$50,000 paid in. They will continue the wholesale and retail business in Hardware, Stoves, Sporting Goods, &c., formerly carried on by J. M. Barker & Co., Mr. Barker being president of the new company. The company have taken possession of a new store, 60 x 140 feet, three stories and basement. It has a plate glass front. They also have a large brick warehouse.

### CONTENTS.

	PAGE.
The Brown Automatic Furnace Charging Machine. Illustrated.....	1
The Foundrymen's Association.....	2
The Paris Machinery Exhibits.....	3
The Westinghouse-Parsons Steam Turbines. Illustrated.....	4
The Carnegie Company's Ore Transportation Interests.....	7
Washington News.....	8
New Merchant Mill at Duquesne.....	8
Southern Industrial Convention.....	8
Lucas & Gliem Horizontal Tool Room Boring Machine. Illustrated.....	9
Mahoning and Shenango Valley Notes.....	9
Canadian News.....	10
American Casting Machine Company.....	10
Classification of Charcoal Tin Plates.....	10
The Moore Pneumatic Motor and Chain and Geared Hoists. Illus.....	11
The Newton Combination Cold Saw Cutting Off Machine. Illus.....	12
Pacific Coast News.....	12
Largest Naval Appropriation Ever Recommended.....	13
Employment for Technical Graduates.....	14
Wind Mill Exports.....	14
Wilcox, Crittenden & Co.'s Improvement.....	14
The Tatum Paper Punching Machines. Illustrated.....	15
Central Pennsylvania News.....	15
Should a Foundry Chemist Be a Practical Melter as Well?	16
Destruction of the Great Dam at Austin.....	16
Australian Notes.....	16
Large Canadian Foundry Company.....	16
Shrinkage of Malleable Iron Castings.....	17
Lake Ore Matters.....	17
The Week.....	18
Editorials:	
<i>The Iron Age</i> Paris Library.....	19
Changed Business Conditions.....	19
Increase in Copper Production of the World.....	19
Canadian Iron and Steel Developments.....	20
The Waste of War.....	20
Correspondence.....	21
Obituary.....	22
New Steel Castings Plant at St. Louis.....	22
Decreasing Pig Iron Production.....	23
Manufacturing:	
Iron and Steel.....	24
Machinery.....	24
Hardware.....	25
Miscellaneous.....	25
The Iron and Metal Trades:	
A Comparison of Prices.....	26
Chicago.....	26
Philadelphia.....	27
St. Louis.....	28
Cincinnati.....	28
Pittsburgh.....	29
Cleveland.....	30
The British Iron Market.....	30
New York.....	31
Metal Market.....	31
Iron and Industrial Stocks.....	32
A New Shovel for Ore Docks.....	32
The Hanging Rock Iron Company.....	33
The New York Rapid Transit Tunnel.....	33
Trade Publications.....	33
International Cable Directories.....	33
The New York Machinery Market.....	34
The Cleveland Machinery Market.....	35
American Sheet Steel Company.....	36
A Large English Weigh Bridge.....	36
Personal.....	37
The Pittsburgh, Bessemer & Lake Erie Railroad.....	37
The British Output of Steel in 1899.....	37
Information Wanted.....	37
Hardware:	
Condition of Trade.....	38
Notes on Prices.....	38
A Danger in the Hardware Market.....	40
The <i>Iron Age</i> Index Supplement.....	40
Requests for Catalogues, &c.....	41
Peerless Rubber Mfg. Company's Catalogue.....	41
Death of John Alling. Portrait.....	41
Trade Winning Methods:	
A Mercantile Parade Float. Illustrated.....	42
Advertising Methods. Illustrated.....	42
Australian Letter.....	43
A Merchant's Grumblings About Manufacturers' Methods.....	44
Boston Belting Company's Catalogue.....	45
Letters from the Trade.....	45
Price-Lists, Circulars, &c.....	45
The Standard Screw Company.....	46
The American Appraisal Company.....	46
Trade Items.....	46
Among the Hardware Trade.....	46
American Mfg. Company.....	48
The Gem Nutmeg Grater. Illustrated.....	48
The Ware Steel Yoke Vise. Illustrated.....	48
The Sterling Slicer. Illustrated.....	48
Diamond Expansion Bolt and Shield. Illustrated.....	48
Extension Rink Roller Skates. Illustrated.....	49
The Barb Wire Fence Builder. Illustrated.....	49
Fairfield Design Store Door Lock. Illustrated.....	50
The Ole Olsen Lawn Rake. Illustrated.....	50
Current Hardware Prices.....	51
Current Metal Prices.....	51

# Current Hardware Prices.

REVISED APRIL 10, 1900.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail merchants. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

## Adjusters Blind—

Domestic,  $\frac{1}{2}$  doz. \$8.00... $\frac{3}{4}$  doz. \$8.50... $\frac{1}{2}$  cwt. 10%

North.... 10%

Zimmerman's—See Fasteners, Blind.

## Window Stop—

Ives' Patent.... 25¢ & 55¢

Taplin's Perfection.... 50¢

## Ammunition—See Caps, Cartridges, Shells, &c.

## Anvils—American—

Eagle Anvils....  $\frac{1}{2}$  doz. 74¢ & 75¢

Hay-Budden, Wrought.... 16¢ & 19¢

Horseshoe brand, Wrought.... 9¢ & 12¢

Sanson.... 9¢ & 12¢

Trenton, Wrought.... 9¢ & 12¢

## Imported—

Armitage's Mouse Hole.... 84¢ & 94¢

Peter Wright's.... 94¢ & 104¢

## Anvil, Vise and Drill—

Millers Falls Co., \$18.00.... 20¢

## Apple Parers—See Parers, Apple, &c.

## Augers and Bits—

Common Double Spur, 60¢ 10¢ & 10¢

Boring Machine Augers.... 60¢ 10¢ & 10¢

Car Bits, 12-in. twist.... 60¢ & 10¢

Jennings' Pattern.... 60¢ & 10¢

Auger Bits.... 60¢ & 10¢

Ford's Auger and Car Bits.... 40¢ 10¢ & 10¢

Forster Pat. Auger Bits.... 85¢

C. E. Jennings & Co.: No. 10 ext. lip. R. Jennings' list.... 40¢ 10¢ & 10¢

No. 80, R. Jennings' List.... 50¢ 10¢ & 10¢

Russell Jennings'.... 50¢ 10¢ & 10¢

L'Hommedieu Car Bits 15¢ & 10¢ & 10¢

Pugh's Black.... 20¢

Pugh's Jennings' Pattern.... 35¢

Snell's Auger Bits.... 60¢

Snell's Bell Hangers' Bits.... 50¢

Snell's Car Bits, 12-in. twist.... 60¢

Wright's Jennings Bits (R. Jennings' list).... 50¢

## Bit Stock Drills—

Standard List.... 65¢ & 65¢ & 10¢

## Expansive Bits—

Clark's small, \$18; large, \$20.... 50¢ & 10¢

Lavigne's Clark's Pattern, No. 1,  $\frac{1}{2}$  doz. \$26; No. 2, \$18.... 50¢ & 10¢

Steer's No. 1, \$38; No. 2, \$18.... 40¢ & 40¢ & 55¢

Swan's.... 60¢

## Gimlet Bits—

Common Double Cut, gro. \$2.75 @ \$3.55

German Pattern.... gro. \$5.00 @ \$6.50

Double Cut, makers' lists.... 50¢ & 50¢ & 10¢

## Hollow Augers—

Ames.... 95¢ & 10¢

Bonney's Adjustable,  $\frac{1}{2}$  doz. \$16.00

New Patent.... 95¢ & 10¢

Universal.... 20¢

## Ship Augers and Bits—

Ford's.... 40¢

Snell's.... 40¢

L'Hommedieu's.... 15¢ & 10¢ & 15¢ & 10¢

Watrous'.... 40¢ & 40¢ & 55¢

## Awl Hafts, See Hafts, Awl.

## Awls—

Brad Awls: Handled.... gro. \$2.75 @ \$3.10

Unhandled, Shouldered gro. 65¢ @ 66¢

Unhandled, Patent.... gro. 66¢ @ 70¢

Peg Awls:

Unhandled, Patent.... gro. 31¢ @ 35¢

Unhandled, Shouldered gro. 65¢ @ 70¢

Scratch Awls:

Handled, Common.... gro. \$3.50 @ 4.00

Handled Socket.... gro. \$11.50 @ 12.00

## Awl and Tool Sets—See Sets, Awl and Tool.

## Axes—

First Quality, best brands, 36¢ & 50¢

First Quality, other brands, 36¢ & 50¢

Jobbers' Special Brands:

Good Quality.... 35.50¢ & 57.5¢

Best Quality.... 46.00¢ @ 6.50

Cheap, Handled Axes.... 36.50¢ & 57.5¢

Beveled, add 25¢ doz.

## Axle Grease—See Grease, Axle.

## Axes—

Concord, loose collar.... 64¢ 6¢ c

Concord, solid collar.... 64¢ 6¢ c

No. 1 Common.... 5¢ 4¢ c

No. 1½ Com. New Style.... 5½¢ 5½¢

No. 2, Solid Collar.... 5½¢ 5½¢

Nos. 7, 8, 11 to 14.... 50¢ 10¢

Nos. 7, 8, 11 to 15, 100 sets.... 80¢

Nos. 15 to 18.... 80¢

Nos. 19 to 22.... 80¢

cash 10 days.

## Boxes, Axle—

Common and Concord, not turned.... 15¢ 5¢

Common and Concord, turned.... 15¢ 6¢

High Patent.... 15¢ 6¢

## Balances—

Sash—

Caldwell new list.... 50¢

Pulman's.... 62½¢

Spring—

Spring Balances.... 50¢ @ 50¢ & 55¢

Chatillon's Light Sash Balances.... 40¢ 10¢

Chatillon Straight Balances.... 40¢

Chatillon Circular Balances.... 50¢

Chatillon's Large Dial.... 50¢

## Beaters—

Egg—

Standard Co.: No. 5 Steel Handle Dover,  $\frac{1}{2}$  gro. \$6.50

No. 10 Cast Handle Dover,  $\frac{1}{2}$  gro. \$8.00

No. 10 St. El Handle Dover,  $\frac{1}{2}$  gro. \$8.00

No. 15 Extra Heavy Steel Handle,  $\frac{1}{2}$  gro. \$15.00

Rival,  $\frac{1}{2}$  gro. \$15.00

Taplin Mfg. Co.:  $\frac{1}{2}$  gro.

No. 50 Small Family size.... 50¢

No. 100 Regular Family size.... 88¢

No. 105 Regular Family size, tinned.... 88¢

No. 150 Large Family size.... 12.00

No. 152 Large Family size, tinned.... 12.00

Lyon's, Standard 12a....  $\frac{1}{2}$  doz. \$1.75

W. S. & Co.:  $\frac{1}{2}$  gro. \$7.50

## Beats, Axle—

Standard List.... 70¢ @ 75¢ & 55¢

Chatillon's No. 1.... 50¢

Chatillon's No. 2.... 40¢

## Beams, Scale—

Scale Beams, List Jan. 12, '95....

30¢ @ 30¢ & 55¢

## Belts—

Extra Length:  $\frac{1}{2}$  in. 48¢ 45¢ 55¢ 50¢ 60¢

Extra Length:  $\frac{1}{2}$  in. 48¢ 45¢ 55¢ 50¢ 60¢

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April 12, 1900



**Latches, Thumb-**  
Roggins' Latches.....doz. 35c@45%

**Lawn Mowers-**  
See Mowers, Lawn.

**Leaders, Cattle-**  
Small.....doz. 45c; large, 55c  
Covert Mfg. Co.....45c@25%

**Lemon Squeezers-**  
See Squeezers, Lemon.

**Lifters, Transom-**

Dickson:  
3 x 4 ft. x 34.....\$100 \$11.00  
Other sizes, Iron.....70&10%  
Other sizes, Brass and Bronze.....70%  
Excelsior.....60@60&10%  
Payson's: Solid Grip Nos. 613 and 614, 70c  
Bronzed Iron.....\$1.00  
70c

**Lines-**

Wire Clothes, Nos. 18 19 20  
100 feet.....\$3.50 \$3.75 \$2.25  
75 feet.....\$1.75

Ossawan Mills:  
Crown Solid Braided Chalk.....\$3.45  
Mason's, No. 0 to No. 3.....\$3.45  
Silver Lake Braided Chalk, No. 0, \$6.00;  
No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50  
\$gt.

**Locks, &c.- Cabinet-**

Cabinet Locks.....\$3.50@35%@7.5%

**Door Locks, Latches, &c.-**  
[Net prices are very often made on  
these goods.]

Reading Hardware Co.....40%  
R. & E. Mfg. Co. ....45c@5%  
Sargent & Co. ....40@40&10%  
Slaymaker-Barry Co. ....30@35%  
Snow's Victor.....50&10%

**Elevator-**

Stowell's.....\$3.50

**Padlocks-**

Wrought Iron, list Dec. 3, '97.....  
70@70&10%

Dog Collar, S. B. Co. ....40%

R. & E. Mfg. Co. Wrt. Steel and Brass.....50%

S. B. & Co. ....40%

**Sash, &c.-**

Fitch's Bronz'd and Brass.....65c@5%  
Fitch's Iron.....70c  
Ives' Patent.....65c@10@60@5@10%

Payson's Perfect.....70c

Payson's Signal (new list).....70c

Heading.....60@10@10@70%

**Machines-**

**Boring-**

Without Augera.  
Upright. Angular.  
Improved No. 3...\$1.25 No. 1 \$5.00  
Improved No. 4...3.75 No. 2 3.38  
Improved No. 5...2.75  
Jennings'.....2.50 3.00  
Millers' Falls.....5.75  
Snell's, Rice's Pat. 2.50 2.75  
Swan's, No. 500...5.10 No. 200 6.45

**Hoisting-**

Moore's Anti-Friction Differential Pulley Block.....30%

Moore's Hand Hoist, with Lock Brake, 20%

**Washing-**

Wayne American, 70c@50c@5%  
Western Star, No. 2, 70c@50c@5%  
doz.....28.00  
Western Star, No. 3, 70c@50c@5%  
doz.....30.00  
St. Louis, No. 41, 70c doz. 60.00

**Mallets-**

Hickory.....45c@50c@5%  
Lignumvitae.....60c@50c@5%  
Tinners', Hickory and Applewood,  
doz.....50@5c  
Fiber Head Stearns'.....30@10%

**Mats-**

Door-  
Elastic Steel (W. G. Co.).....10%

**Mattocks-**

List Feb. 23, 1899.....65@65@10%

**Meat Cutters-**

See Cutters, Meat.

**Milk Cans- See Cans, Milk.**

**Mills- Coffee-**

Box and Side, list Jan. 1, '98.....  
60@5@80@10@5%

Net prices are often made on some  
goods which are lower than above  
discounts.

Enterprise Mfg. Co.....25@30%

National, list Jan. 1, '94.....30%

Parker's Columbia and Victor.....60@10%

Parker's Upright.....30@10@40%

Swift, Lane Bros.....30%

**Mincing Knives-**

see Knives, Mincing.

**Molasses Gates-**

See Gates, Molasses.

**Money Drawers-**

See Drawers, Money.

**Mowers, Lawn-**

Net prices are generally quoted.

10 12 14 16-inch

Cheap.....\$1.25@5@2.10

Good.....3.25 3.50 3.75 4.00

High Grade 4.25 4.50 4.75 5.00

Pennsylvania and Continental 60@10@25%

Quaker City.....70@5%

Great American.....70@5%

**Philadelphia:**

Styles M., S., C., K., T.....70@10%  
Style A, all Steel.....60@10%  
Style E, Low Wheel.....60@10%  
Style E, High Wheel.....70@10%

Drexel and Gold Coin, low list.....50%

**Nails-**

Cut and Wire. See Trade Report.

Wire Nails and Brads, Prepared.

List July 20, 1899.....80@80@10%

Hungarian, Finishing, Upholsterers, &c. See Tacks.

**Horse-**

Nos. 6 7 8 9 10

A. C. 25c 28c 22c 21c 21c

40@5%

Capewell.....19c 18c 17c 16c 16c@8.5%

C. K. 25c 25c 22c 21c 21c 21c

40@4%

Champlain.....28c 26c 25c 24c 23c

40@5@2%

Maud S. ....25c 23c 22c 21c 21c

50@5%

Neponset.....23c 21c 20c 19c 18c

40%

Putnam.....23c 21c 20c 19c 18c

33c@5%

Standard.....23c 21c 20c 19c 18c

40%

Star.....23c 21c 20c 19c 18c

40@5@2%

Vulcan.....23c 21c 20c 19c 18c

25@10%

**Nippers, See Pliers and Nippers.**

**Nut Crackers-**

See Crackers, Nut.

**Nuts-**

List Feb. 1, '99.

Cold Punched.

Off Mfrs. or U. S. Standard List.

Hexagon, plain.....5.00@4.10c

Square, plain.....5.00@4.10c

Square, C. T. & R. ....5.00@3.90c

Hexagon, C. T. & R. ....4.30@4.40c

**Hot Pressed:**

Mfrs., U. S. or Nar. Gauge Stan'd.

Square.....4.30@4.50c

Hexagon.....5.00@4.70c

NOTE-Tapped Nuts are now 2-10c  
higher than above.

**Oakum-**

Beat or Government.....lb. 64c

Navy.....lb. 5 c

U. S. Navy.....lb. 54c

Plumber's Spun Navy.....5 c

In carload lots 54c lb. off f.o.b. New York.

**Oil Tanks- See Tanks, Oil.**

**Oilers-**

Brass and Copper.....40@10@50%

Tin or Steel.....60d@10@10@70c@5%

Zinc.....60d@5@50@10%

Maliceable, Hammers' Improved, No. 1  
\$2.00; No. 2, \$4; No. 3, \$4.40 @ 20c

Maliceable, Hammers' Old Pattern,  
same list.....50@10@5%

Wilmot & Hobbs Mfg. Co .....70@70@10%

**Openers-**

Can-

French.....per doz. 35c

Fron Handle.....per doz. 25c@27c

Sprague, Iron Edge, per doz. 35@40c

Sardine Scissors, doz. 81.75@83.00

National, 70c

Stowell's.....per doz. 40@45c

Egg-

Nickel Plate.....per doz. \$2.00

Silver Plate.....per doz. \$4.00

**Packing-**

Rubber-

Standard, fair quality.....70@10@75%

Inferior quality.....75@10@80@30%

Extra.....60@8@60@10@5%

Jenkins' Standard, 70c@80c. 25@25@5%

Miscellaneous-

American Packing.....9@10c lb.

Cotton Packing.....15@14c lb.

Italian Packing.....10@11c lb.

Jute.....15@14c lb.

Russia Packing.....12@13c lb.

**Pails-**

Creamery-

S. S. & Co., with gauges. No 1 \$6.50;

No 2, \$7.50 @ 70c

**Galvanized-**

Inch.....10 12 14

Water, Standard, gro. \$35.00 \$26.00 \$29.00

Water, Regular .. 18.00 21.00 24.00

Water, Heavy... 22.00 25.50 \$3.00

Fire, Ed. Bottom, gro.....31.00 33.00 35.00

Well, gro.....27.00 29.00 31.00

**Dripping-**

Large Sizes.....lb. 43c

Small Sizes.....lb. 54c

**Fry-**

Standard List.....75@11@80%

**Roasting and Baking-**

Revol. S. S. & Co., 70c doz. Nos. 5, 8, 10;

10, \$5.00; 20, \$5.50; 30, \$6.00

Simplex, 70c gro. No. 40, \$30.00; 50,

\$34.50; 60, \$39.00; 140, \$33.00; 150,

\$37.50; 160, \$43.00.

**Paper-**

Building Paper-

Rosin Sized Sheathing: 500 sq. ft.

Light wt. 20 sq. ft. to lb. 40@4.45c

Medium wt. 12 sq. ft. to lb. 40@6.65c

Heavy wt. extra quality. 50@9c@10.5%

Medium Grades Water Proof Sheathing.....50@8c@12.5%

Deafening Felt, 9, 6 and 4.5 sq. ft. to lb. ton. \$45.00@59.40

York Haven Waterproof Sheathing.....\$1.35@1.75

**Tarred Paper.**

1 ply (roll 300 sq. ft.), ton. \$35.00@40.00

1/2 ply, roll 100 sq. ft. ....90c

3/4-lb. roll 100 sq. ft. ....\$1.26

**Sand and Emery-**

List Dec. 23, 1899. 50@10@50@10@10%

See Trade Report.

**Parers-**

Apple-

Advance.....\$4.50

Baldwin.....\$5.00

Bonanza.....each \$5.00

Dandy.....each \$7.50

Eureka, 1898.....each \$16.00

Fairfield.....each \$12.00

Family.....each \$12.00

Gandy.....each \$12.00

Heath.....each \$12.00

Hudson.....each \$12.00

Iron.....each \$12.00

Kent.....each \$12.00

Landis.....each \$12.00

Leeds.....each \$12.00

Longfellow.....each \$12.00

McKee.....each \$12.00

Metropolitan.....each \$12.00

Monroe.....each \$12.00

Northrup.....each \$12.00

Parsons.....each \$12.00

Perkins.....each \$12.00

Power.....each \$12.00

Reed.....each \$12.00

Shaw.....each \$12.00

Spangler.....each \$12.00

Stevens.....each \$12.00

Stewart.....each \$12.00

Stewart.....each \$12.00



**Shovels and Tongs—**

Brass Head.....	.60@.60&10%
Iron Head.....	.60@.60&10%
<b>Sieves and Sifters—</b>	
Hunter's Imitation, gro.	\$11.00@18.00
Buffalo Metallic Blued, S. S. & Co., 7 gr.	
14x16 16x18 18x20	
\$12.00 \$13.80 \$15.00	
Eclipse.....	.P gr. \$10.00
Electric Light.....	.P gr. \$12.00
Hunter's Genuine.....	.P gr. \$12.50
Shaker (Barter's Pat.) Flour Sifters.....	\$2.00
P doz. \$2.00	

**Sieves and Sifters—**

Hunter's Imitation, gro. \$11.00@18.00

Buffalo Metallic Blued, S. S. &amp; Co., 7 gr.

14x16 16x18 18x20

\$12.00 \$13.80 \$15.00

Eclipse..... P gr. \$10.00

Electric Light..... P gr. \$12.00

Hunter's Genuine..... P gr. \$12.50

Shaker (Barter's Pat.) Flour Sifters..... \$2.00

**Sieves and Sifters—**

Nestled, 10, 11 and 12 Inch.

Mesh 15, Nestled, doz. \$0.75@0.80

Mesh 20, Nestled, doz. .85@.90

Mesh 24, Nestled, doz. 1.00@1.05

**Sinks—****Cast Iron—**

Low list..... 50@10@0.80

Note.—The low list is now generally used, but some jobbers use high list.

**Wrought Steel—**

Columbus Galv'd and Enamelled. 80@5%

Columbus, Painted..... 45@5%

L. &amp; G. .... 50@5%

**Skeins, Wagon—**

Cast Iron..... 70@70@10%

Malleable Iron..... 40@10@50%

Steel..... 35@35@5%

I. L. &amp; B. Co. Steel..... 35@5%

**Slates—**

"D" Slates..... 50@10@50@10@10%

Unexcelled Noiseless Slates..... 60@6 tens@80@6 tens@5%

Wire Bound..... 40@10@50%

Double Slates, add \$1 case, net.

**Slaw Cutters—See Cutters.****Snaps, Harness—**

German..... 40@40@10%

Covert Mfg. Co.:

Derby..... 85@9%

High Grade..... 45@2%

Jockey..... 40@2%

Trojan..... 45@9%

Covert's Saddlery Works:

Banner..... 60@10%

Crown..... 60@10%

Triumph..... 60@10%

W. &amp; E. T. Fitch Co.:

Bristol..... 40@10%

Empire..... 50@5%

German..... 40@5%

National..... 50@5%

Perfect..... 45@5%

Clipper..... 50@5%

Champion..... 40@5%

Security..... 40@5%

Victor..... 60@5%

Oneida Community:

Solid Steel..... 65@65@10%

Solid Swivel..... 55@10@10@10%

Sargent's Patent Guarded..... 60@60@60@10%

**Snares—**

Scythe..... 45@5%

**Snips, Tinnings'—See Shears.****Soldering Irons—**

See Irons, Soldering.

**Spoke Trimmers—**

See Trimmers, Spoke.

**Spoons and Forks—**

Silver Plated—

Flat Ware..... 60@10@60@10%

Wm. Rogers Mfg. Co. .... 50@10%

**Miscellaneous—**

German Silver..... 60@10%

Wm. Rogers Mfg. Co.:

18% German Silver..... 60@5%

Rogers' Silver Metal..... 50@10%

**Springs—****Door—**

Gen. (Coll.)..... 20@5%

Star (Coll.)..... 30@5%

Torrey's Rod, 39 in. P doz. \$1.10@1.25

Warren's No. 1, P doz. \$1.50; No. 2, \$3.40

Victor (Coll.)..... 60@10@60@10@5%

**Carriage, Wagon, &c.**

1/4 in. and wider—Blk. Hf. Brt. Brt.

Tested and Temp 5% 5% 6c lb

Oil Tested and

Tempered..... 6% 6% 7c lb

Cliff's Bolster Springs..... 35@5%

Cliff's Seat Springs..... 5 pair 5@5%

**Sprinklers, Lawn—**

Enterprise..... 25@30@

Philadelphia, No. 1, P doz. \$12; No. 2, \$15; No. 3, \$24.

**Squares—**

Nickel plated..... List Jan. 5, 1900

Steel and Iron..... 70@70@10%

Roswell &amp; Hdl. Try Square and T-Bevels..... 60@10@10@70%

Iron Hdl. Try Squares and T-Bevels..... 60@10@60@10@10%

Dixon's Try Sq. and T-Bevels..... 60@10%

Winterbottom's Try and Mitre..... 50@10%

**Squeezers—****Lemon—**

Wood, Common, gro., No. 0, \$5.25

@55@5; No. 1, \$6.25@6.50.

Wood, Porcelain Lined;

Cheap..... doz. \$2.00@2.75

Good Grade..... doz. \$3.00@3.50

**Tapes, Measuring—**

American Asses' Skin..... 10@10@50%

Patent Leather..... 15@20@5%

Steel..... 10@10@50%

Chesterman's..... 25@25@5%

**Tanks, Oil—**

Emerald, S. S. &amp; Co..... 30-gal. \$3.20

Emerald, S. S. &amp; Co..... 60-gal. \$4.00

Queen City S. S. &amp; Co. 50-gal. \$3.50

Queen City S. S. &amp; Co. 90-gal. \$4.25

**Miscellaneous—**

Double Point Tacks..... 9@4 or 5 tens

Steel Wire Brads, R. &amp; E. Mfg. Co.'s list..... 50@10@50%

See also Nails, Wire.

**Tapes, Measuring—**

American Asses' Skin..... 10@10@50%

Patent Leather..... 15@20@5%

Steel..... 10@10@50%

Chesterman's..... 25@25@5%

Tinned Iron.....	doz. \$0.75@1.25
Iron, Porcelain Lined	doz. \$3.90@3.25
Jennings' Star.....	P doz. \$1.85@1.90
Klug.....	P doz. \$1.00

Eddy's Steel..... 40@40@5%

Eddy's Metallic..... 33@33@5%

Keuffel &amp; Esser Co. Steel and Metallic

Lower list, 1899..... 35%

Lufkin's Steel..... 33@33@5%

Lufkin's Metallic..... 30@30%

Tin Case..... 80@80@10%

Ties, Bale—Steel.

Standard Wire..... 50@10@5%

Ties, Wall—

Cleveland, Steel..... P 1000, \$10.00

Tinners' Shears, &amp;c.—

See Shears, Tinners', &amp;c.

Tinware—

Stamped, Japanned and Pieced, sold

very generally at net prices.

Tire Binders, Upsetters, &amp;c.—

See Binders and Upsetters, Tire.

Tobacco Cutters—

See Cutters, Tobacco.

Tools—

Coopers'—

L. &amp; I. J. White ..... 20@20@5%

Saw—

Atkins' new list..... 40@

Simonds' Improved..... 39@44@

Simonds' Crescent..... 25@

Ship—

L. &amp; I. J. White ..... 25@

Transom Lifters—

See Lifters, Transom.

Traps— Game—

Oneida Pattern..... 70@10@75@10%

Newhouse..... 45@50@

Hawley &amp; Norton..... 65@65@70%

Victor (Oneida Pattern)..... 75@75@10%

Star (Blake Pattern)..... 65@10@70@5%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes. 9@10%

Mouse, Round or Square Wire.....

doz. \$0.85@1.00

Marty French Rat and Mouse Trap (Genuine):

No. 1, Rat, P doz. \$19.00; case of 24

\$10.50

No. 3, Rat, P doz. \$5.50; case of 50

\$1.00

No. 8, Rat, P doz. \$1.50; case of 72

\$1.00

No. 4, Mouse, P doz. \$3.50; case of 72

\$2.75

No. 5, Mouse, P doz. \$2.75; case of 150

\$2.25

Schuyler's Rat Killer, No. 1, P gr. \$30.00;

No. 2, P gr. \$30.00; Mouse, No. 3,

\$18.00.....

Out o' Sight, Mouse, No. 1, P doz. 6@;

Rat, No. 2, \$1.25; Mole, \$6.00;

Gopher, \$1.50; Stop Thief, No. 1,

\$1.25; No. 2, \$1.50.

Fly—

Balloon, Globe or Acme.....

doz. \$1.15@1.25; gro. \$12.00@1.00

Harper, Champion or Paragon.....

doz. \$1.25@1.40; gro. \$13.50@1.00

Trimmers, Spoke—

Bonney's No. 1 and 2..... 40@

Stearns'..... 25@

Trowels—

Dinton Brick and Pointing..... 30@

Dinton Plastering..... 25@

Dinton Standard Brand' and Garde...  
den Trowels..... 40@

Never-Break steel Garden Trowels.....

gro. \$7.00

Peace's Plastering..... 30@

Rose Brick and Plastering..... 25@25@

Woodrough &amp; McParlin, Plastering. 25@10@

Trucks, Warehouse, &amp;c.—

B. &amp; L. Block Co.'s list..... 40@

Daly Stove Trucks, Improved pattern

P doz. \$21.00

Tubs, Wash—

No. 1 2 3

Galvanized, per doz. \$5.00 5@6.00

Attachment, P doz. No. 10, \$7.35

No. 20, \$7.75; No. 30..... \$8.25

Twine— Binder—

Carload lots f.o.b. New York, Phila...  
delphia or Boston.

White Seal, 500 ft. to lb. per lb. 11@4

Standard, 500 ft. to lb. per lb. 11@4

Manila, 600 ft. to lb. per lb. 11@4

Pure Manila, 650 ft. to lb. per lb. 11@4

Less than carloads add 14@16@18@20@

Miscellaneous—

Flax Twine— BC B.

No. 14 and 1/2-lb. Balls.... 25@

No. 18, 1/2 and 1/4-lb. Balls.... 19@

No. 24, 1/4 and 1/2-lb. Balls.... 19@

No. 30, 1/2 and 1/4-lb. Balls.... 15@

Chalk Line, Cotton, 1/2-lb. Balls....

18@20@

Cotton Mops, 6, 9, 12 and 15 lbs. to

doz. 7@8@

Cotton Wrapping, 5 Balls to lb. ....

9@10@

American 2-Ply Hemp, 1/4 and 1/2-lb. Balls....

12@15@

American 5-Ply Hemp, 1-lb. Balls....

12@15@

India 2-Ply Hemp, 1/4 and 1/2-lb. Balls

<b>Washers—</b>	
<b>Leather, Axle—</b>	
Solid.....	.80@10@10@85%
Patent.....	.85@85@85%
Coil: 1/8 1 1/8 1/4 Inch.	1/8 1/8 1/8 1/8 100
Iron or Steel—	
Size bolt: 5-16 5-16 5-16 5-16 5-16	5-16 5-16 5-16 5-16 5-16
Washers.....	.86@20 5-16 4-00 5-16 5-16
In lots less than one keg add 1/4¢ per lb., 5-lb. boxes add 1/4¢ to list.	5-16 5-16 5-16 5-16 5-16
Cast Washers—	
Over 1/8 inch barrel lots....per lb., 2¢	
Washer Cutters—	
See Cutters, Washer.	
Washing Machines—	
See Machines, Washing.	
Water Coolers—	
See Coolers, Water.	
Weaners—	
Trier's New Halter, No. 1 \$1.45; No. 2, \$2.70; No. 3, \$4.00; No. 4, \$4.35; Trier's Safety—Nos. 1 and 2, \$1.70; No. 3, \$2.00; No. 4, \$2.30.	
Wedges—	
Oil Finish.....lb. 1/2@1/4c	
Axe Finish.....lb. 1/4@1/4c	

<b>Weights, Sash—</b>	
Easter prices.....	\$25.00@\$27.00
Western prices.....	\$20.00@\$23.50
<b>Note.—There is a wide difference in prices East and West, and some founders are naming lower prices than the above</b>	
<b>Well Buckets, Galvanized</b>	
See Pails, Galvanized.	
<b>Wheels Well—</b>	
8-in., \$1.75@2.00; 10-in., \$2.25@2.60; 12-in., \$2.75@3.25; 14-in., \$3.00@3.50	
<b>Wire and Wire Goods—</b>	
Brt. and Ann., 6 to 9.....65@65@5%	
Brt. and Ann., 10 to 15.....65@67@5%	
Brt. and Ann., 16 to 20.....72@73@74@75@76@77@78@79@710@711@712@713@714@715@716@717@718@719@720@721@722@723@724@725@726@727@728@729@730@731@732@733@734@735@736@737@738@739@740@741@742@743@744@745@746@747@748@749@750@751@752@753@754@755@756@757@758@759@7510@7511@7512@7513@7514@7515@7516@7517@7518@7519@7520@7521@7522@7523@7524@7525@7526@7527@7528@7529@7530@7531@7532@7533@7534@7535@7536@7537@7538@7539@7540@7541@7542@7543@7544@7545@7546@7547@7548@7549@7550@7551@7552@7553@7554@7555@7556@7557@7558@7559@7560@7561@7562@7563@7564@7565@7566@7567@7568@7569@7570@7571@7572@7573@7574@7575@7576@7577@7578@7579@7580@7581@7582@7583@7584@7585@7586@7587@7588@7589@7590@7591@7592@7593@7594@7595@7596@7597@7598@7599@75100@75101@75102@75103@75104@75105@75106@75107@75108@75109@75110@75111@75112@75113@75114@75115@75116@75117@75118@75119@75120@75121@75122@75123@75124@75125@75126@75127@75128@75129@75130@75131@75132@75133@75134@75135@75136@75137@75138@75139@75140@75141@75142@75143@75144@75145@75146@75147@75148@75149@75150@75151@75152@75153@75154@75155@75156@75157@75158@75159@75160@75161@75162@75163@75164@75165@75166@75167@75168@75169@75170@75171@75172@75173@75174@75175@75176@75177@75178@75179@75180@75181@75182@75183@75184@75185@75186@75187@75188@75189@75190@75191@75192@75193@75194@75195@75196@75197@75198@75199@75200@75201@75202@75203@75204@75205@75206@75207@75208@75209@75210@75211@75212@75213@75214@75215@75216@75217@75218@75219@75220@75221@75222@75223@75224@75225@75226@75227@75228@75229@75230@75231@75232@75233@75234@75235@75236@75237@75238@75239@75240@75241@75242@75243@75244@75245@75246@75247@75248@75249@75250@75251@75252@75253@75254@75255@75256@75257@75258@75259@75260@75261@75262@75263@75264@75265@75266@75267@75268@75269@75270@75271@75272@75273@75274@75275@75276@75277@75278@75279@75280@75281@75282@75283@75284@75285@75286@75287@75288@75289@75290@75291@75292@75293@75294@75295@75296@75297@75298@75299@752910@752911@752912@752913@752914@752915@752916@752917@752918@752919@752920@752921@752922@752923@752924@752925@752926@752927@752928@752929@752930@752931@752932@752933@752934@752935@752936@752937@752938@752939@752940@752941@752942@752943@752944@752945@752946@752947@752948@752949@752950@752951@752952@752953@752954@752955@752956@752957@752958@752959@752960@752961@752962@752963@752964@752965@752966@752967@752968@752969@752970@752971@752972@752973@752974@752975@752976@752977@752978@752979@752980@752981@752982@752983@752984@752985@752986@752987@752988@752989@752990@752991@752992@752993@752994@752995@752996@752997@752998@752999@7529100@7529101@7529102@7529103@7529104@7529105@7529106@7529107@7529108@7529109@7529110@7529111@7529112@7529113@7529114@7529115@7529116@7529117@7529118@7529119@7529120@7529121@7529122@7529123@7529124@7529125@7529126@7529127@7529128@7529129@7529130@7529131@7529132@7529133@7529134@7529135@7529136@7529137@7529138@7529139@7529140@7529141@7529142@7529143@7529144@7529145@7529146@7529147@7529148@7529149@7529150@7529151@7529152@7529153@7529154@7529155@7529156@7529157@7529158@7529159@7529160@7529161@7529162@7529163@7529164@7529165@7529166@7529167@7529168@7529169@7529170@7529171@7529172@7529173@7529174@7529175@7529176@7529177@7529178@7529179@7529180@7529181@7529182@7529183@7529184@7529185@7529186@7529187@7529188@7529189@7529190@7529191@7529192@7529193@7529194@7529195@7529196@7529197@7529198@7529199@75291910@75291911@75291912@75291913@75291914@75291915@75291916@75291917@75291918@75291919@75291920@75291921@75291922@75291923@75291924@75291925@75291926@75291927@75291928@75291929@75291930@75291931@75291932@75291933@75291934@75291935@75291936@75291937@75291938@75291939@75291940@75291941@75291942@75291943@75291944@75291945@75291946@75291947@75291948@75291949@75291950@75291951@75291952@75291953@75291954@75291955@75291956@75291957@75291958@75291959@75291960@75291961@75291962@75291963@75291964@75291965@75291966@75291967@75291968@75291969@75291970@75291971@75291972@75291973@75291974@75291975@75291976@75291977@75291978@75291979@75291980@75291981@75291982@75291983@75291984@75291985@75291986@75291987@75291988@75291989@75291990@75291991@75291992@75291993@75291994@75291995@75291996@75291997@75291998@75291999@752919100@752919101@752919102@752919103@752919104@752919105@752919106@752919107@752919108@752919109@752919110@752919111@752919112@752919113@752919114@752919115@752919116@752919117@752919118@752919119@752919120@752919121@752919122@752919123@752919124@752919125@752919126@752919127@752919128@752919129@752919130@752919131@752919132@752919133@752919134@752919135@752919136@752919137@752919138@752919139@752919140@752919141@752919142@752919143@752919144@752919145@752919146@752919147@752919148@752919149@752919150@752919151@752919152@752919153@752919154@752919155@752919156@752919157@752919158@752919159@752919160@752919161@752919162@752919163@752919164@752919165@752919166@752919167@752919168@752919169@752919170@752919171@752919172@752919173@752919174@752919175@752919176@752919177@752919178@752919179@752919180@752919181@752919182@752919183@752919184@752919185@752919186@752919187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All Metals Carefully GRADED and Made FREE of Iron.



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Let's see!

100 oilers in use—

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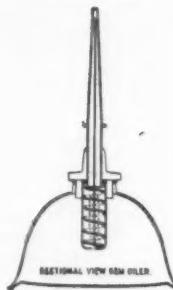
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Cold drawing imparts to steel tubing a density, toughness and ductility not found in any lap welded tubing. A smoother finish and greater ductility than any tubing made for Armature Journals, Traction Engines, Locomotive Bushings, Hydraulic Tubes, Pneumatic Hoists and all mechanical purposes.

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Rookery Bldg., Chicago.

J. J. LYNN, Port Huron, Mich.

# CURRENT METAL PRICES.

APRIL 11, 1900.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

**IRON AND STEEL—  
Bar Iron from Store—**

Common Iron: Duty, Round, 0.6¢ per lb; Square, 0.8¢ per lb  
1 to 1½ in. round and square ..... 7¢ per lb 2.30@2.40¢  
1½ to 4 in. x ¾ to 1 in. ..... 7¢ per lb 2.60@2.80¢

Refined Iron:

1 to 1½ in. round and square ..... 7¢ per lb 2.40@2.50¢

1½ to 4 in. x ¾ to 1 in. ..... 7¢ per lb 2.60@2.80¢

1½ to 4 in. x ¾ to 5-16. ..... 7¢ per lb 2.60@2.80¢

Rod iron and 11-16 round and square. 7¢ per lb 2.60@2.80¢

Angles, etc., sizes, 7¢ per lb 2.60@2.80¢

Tees, etc., sizes, 7¢ per lb 2.60@2.80¢

Beams, etc., sizes, 7¢ per lb 2.60@2.80¢

Channels, 3 in. and larger ..... 7¢ per lb 2.60@2.80¢

Bands, 1½ to 6 x 3-16 to No. 8. ..... 7¢ per lb 2.60@2.80¢

Pulver's "H. B. &amp; S." Iron, base price ..... 7¢ per lb 2.60@2.80¢

price. ..... 7¢ per lb 2.60@2.80¢

"Water" ..... 7¢ per lb 2.60@2.80¢

Norway Bars ..... 7¢ per lb 2.60@2.80¢

Norway Shapes ..... 7¢ per lb 2.60@2.80¢

**Merchant Steel from Store—**

Open Hearth and Bessemer Machinery ... 2.80 to 2.90¢  
Toe Calk, Tire and Sleigh Shoe. .... 3.75@4.00¢  
Best Cast Steel, base price in small lots. .... 8¢  
Best Cast Steel Machinery, base price in small lots. .... 8¢

per lb

Common R. G. Cleaned American. .... 8.20¢

S-16 inch. .... 8.05¢ No. 16. .... 8.30¢

No. 8. .... 8.10¢ No. 18. .... 8.35¢

No. 10. .... 8.10¢ No. 20. .... 8.40¢

No. 12. .... 8.15¢ No. 22. .... 8.45¢

**Sheet Iron from Store.**
**Black.**

Common R. G. Cleaned American. .... 8.20¢  
American. .... 8.35¢

Nos. 10 to 16. .... 8.35¢ 8.40¢

Nos. 17 to 21. .... 8.40¢ 8.45¢

Nos. 22 to 24. .... 8.45¢ 8.50¢

Nos. 25 and 26. .... 8.50¢ 8.60¢

No. 27. .... 8.55¢ 8.65¢

No. 28. .... 8.60¢ 8.70¢

**Russia, Planished, &c.**

Genuine Russia, according to assortment. .... 8.10¢  
Patent Planished. .... 8.10¢ A, 10¢ B, 9¢ net.

**Galvanized.**

B. B. .... 70¢@70¢@75¢

Nos. 10 to 16. .... 70¢@70¢@75¢

Nos. 17 to 21. .... 70¢@70¢@75¢

Nos. 22 to 24. .... 70¢@70¢@75¢

Nos. 25 to 26. .... 70¢@70¢@75¢

No. 27. .... 70¢@70¢@75¢

No. 28. .... 70¢@70¢@75¢

No. 30. .... 70¢@70¢@75¢

86 in. 12¢ per lb higher.

**Foreign Steel from Store—**

Best Cast. .... 8.15¢ B. B. .... 15¢

Extra Cast. .... 8.15¢ B. B. .... 18¢@20¢

Swaged, Cast. .... 8.15¢ B. B. .... 18¢

Best Double Shear. .... 8.15¢ B. B. .... 15¢

Blister, 1st quality. .... 8.15¢ B. B. .... 13¢

German Steel, Best. .... 8.15¢ B. B. .... 10¢

2d quality. .... 8.15¢ B. B. .... 9¢

3d quality. .... 8.15¢ B. B. .... 8¢

Sheet Cast Steel, 1st quality. .... 8.15¢ B. B. .... 15¢

2d quality. .... 8.15¢ B. B. .... 14¢

3d quality. .... 8.15¢ B. B. .... 13¢

R. Musket's "Special" Annealed. .... 8.15¢ B. B. .... 75¢

" " " Titanic. .... 8.15¢ B. B. .... 19¢

Hobson's Choice XX Extra Best. .... 8.15¢ B. B. .... 35¢

Jessop Self Hardening. .... 8.15¢ B. B. .... 45¢

Seaman's "Nelson" Steel. .... 8.15¢ B. B. .... 40¢

Hobson Self-Hardening. .... 8.15¢ B. B. .... 40¢

**METALS—**
**Tin—**

Duty.—Pigs, Bars and Block. Free. .... Per lb

Banca, Pigs. .... 33¢@34¢

Straits, Pigs. .... 33¢@34¢

Straits in Bars. .... 33¢@34¢

**Tin Plates—**
**American Charcoal Plates.**

Calland Grade: IC, 14 x 20. .... 8.75¢

IX, 14 x 20. .... 9.00¢

Melyn Grade: IC, 14 x 20. .... 7.00¢

IX, 14 x 20. .... 8.50¢

Allway Grade: IC, 14 x 20. .... 6.15¢

IX, 14 x 20. .... 7.25¢

**American Coke Plates—Bessemer—**

IC, 14 x 20. .... 108¢ B. .... 85.30@85.40¢

IX, 14 x 20. .... 85.30@85.40¢

XXX, 14 x 20. .... 7.50@7.60¢

**American Terne Plates—**

IC, 20 x 28. .... \$10.50

IX, 20 x 28. .... 12.50¢

**Tin Boiler Plates, American—**

XXX, 14 x 26. .... 112 sheets. .... \$18.00

XXX, 14 x 28. .... 112 sheets. .... 14.00

XXX, 14 x 31. .... 112 sheets. .... 15.50

**Copper—**

Duty: Pig, Bar and Ingot and Old Copper free Manufactured, 24¢@25¢

**Ingots—**

Lake. .... 18¢@18.4¢

Ansonia grade Casting. .... 17.5¢@17.5¢

**Sheet and Bolt—**

January 19, 1900.

No. 2

Prices, in cents per pound.

Sheet 10¢ lb.

Not wider than

Ins. Ins. Ins. Ins.

Not longer than

Ins. Ins. Ins. Ins.

And longer than

Ins. Ins. Ins. Ins.

64 oz. &amp; over, gold/sheet.

go to do and heavier.

38 oz. go to do, 45 to

gold/sheet.

44 oz. to 59 oz. 18¢/lb.

50 to 65 lb. 20¢/lb.

66 to 80 lb. 22¢/lb.

81 to 105 lb. 24¢/lb.

106 to 130 lb. 26¢/lb.

131 to 155 lb. 28¢/lb.

156 to 180 lb. 30¢/lb.

181 to 205 lb. 32¢/lb.

206 to 230 lb. 34¢/lb.

231 to 255 lb. 36¢/lb.

256 to 280 lb. 38¢/lb.

281 to 305 lb. 40¢/lb.

306 to 330 lb. 42¢/lb.

331 to 355 lb. 44¢/lb.

356 to 380 lb. 46¢/lb.

381 to 405 lb. 48¢/lb.

406 to 430 lb. 50¢/lb.

431 to 455 lb. 52¢/lb.

456 to 480 lb. 54¢/lb.

481 to 505 lb. 56¢/lb.

506 to 530 lb. 58¢/lb.

531 to 555 lb. 60¢/lb.

556 to 580 lb. 62¢/lb.

581 to 605 lb. 64¢/lb.

606 to 630 lb. 66¢/lb.

631 to 655 lb. 68¢/lb.

656 to 680 lb. 70¢/lb.

681 to 705 lb. 72¢/lb.

706 to 730 lb. 74¢/lb.

731 to 755 lb. 76¢/lb.

756 to 780 lb. 78¢/lb.

781 to 805 lb. 80¢/lb.

806 to 830 lb. 82¢/lb.

831 to 855 lb. 84¢/lb.

856 to 880 lb. 86¢/lb.

881 to 905 lb. 88¢/lb.

906 to 930 lb. 90¢/lb.

931 to 955 lb. 92¢/lb.

956 to 980 lb. 94¢/lb.

981 to 1005 lb. 96¢/lb.

1006 to 1030 lb. 98¢/lb.

1031 to 1055 lb. 100¢/lb.

1056 to 1080 lb. 102¢/lb.

1081 to 1105 lb. 104¢/lb.

1106 to 1130 lb. 106¢/lb.

1131 to 1155 lb. 108¢/lb.

1156 to 1180 lb. 110¢/lb.

1181 to 1205 lb. 112¢/lb.

1206 to 1230 lb. 114¢/lb.

1231 to 1255 lb. 116¢/lb.

1256 to 1280 lb. 118¢/lb.

1281 to 1305 lb. 120¢/lb.

1306 to 1330 lb. 122¢/lb.

1331 to 1355 lb. 124¢/lb.

1356 to 1380 lb. 126¢/lb.

1381 to 1405 lb. 128¢/lb.

1406 to 1430 lb. 130¢/lb.

1431 to 1455 lb. 132¢/lb.

1456 to 1480 lb. 134¢/lb.

1481 to 1505 lb. 136¢/lb.

1506 to 1530 lb. 138¢/lb.

1531 to 1555 lb. 140¢/lb.

1556 to 1580 lb. 142¢/lb.

1581 to 1605 lb. 144¢/lb.

1606 to 1630 lb. 146¢/lb.

1631 to 1655 lb. 148¢/lb.

1656 to 1680 lb. 150¢/lb.

1681 to 1705 lb. 152¢/lb.

1706 to 1730 lb. 154¢/lb.

1731 to 1755 lb. 156¢/lb.

1756 to 1780 lb. 158¢/lb.

1781 to 1805 lb. 160¢/lb.

1806 to 1830 lb. 162¢/lb.

1831 to 1855 lb. 164¢/lb.

1856 to 1880 lb. 166¢/lb.

1881 to 1905 lb. 168¢/lb.

1906 to 1930 lb. 170¢/lb.

1931 to 1955 lb. 172¢/lb.

1956 to 1980 lb. 174¢/lb.

1981 to 2005 lb. 176¢/lb.

2006 to 2030 lb. 178¢/lb.

2031 to 2055 lb. 180¢/lb.

2056 to 2080 lb. 182¢/lb.

2081 to 2105 lb. 184¢/lb.

2106 to 2130 lb. 186¢/lb.

2131 to 2155 lb. 188¢/lb.

2156 to 2180 lb. 190¢/lb.

2181 to 2205 lb. 192¢/lb.

2206 to 2230 lb. 194¢/lb.

2231 to 2255 lb. 196¢/lb.

2256 to 2280 lb. 198¢/lb.

2281 to 2305 lb. 200¢/lb.

2306 to 2330 lb. 202¢/lb.

2331 to 2355 lb. 204¢/lb.

2356 to 2380 lb. 206¢/lb.

2381 to 2405 lb. 208¢/lb.

2406 to 2430 lb. 210¢/lb.

2431 to 2455 lb. 212¢/lb.

2456 to 2480 lb. 214¢/lb.

2481 to 2505 lb. 216¢/lb.

2506 to 2530 lb. 218¢/lb.

2531 to 2555 lb. 220¢/lb.

2556 to 2580 lb. 222¢/lb.

2581 to 2605 lb. 224¢/lb.

2606 to 2630 lb. 226¢/lb.

2631 to 2655 lb. 228¢/lb.

2656 to 2680 lb. 230¢/lb.

2681 to 2705 lb. 232¢/lb.

2706 to 2730 lb. 234¢/lb.

2731 to 2755 lb. 236¢/lb.

2756 to 2780 lb. 238¢/lb.

2781 to 2805 lb. 240¢/lb.

2806 to 2830 lb. 242¢/lb.

2831 to 2855 lb. 244¢/lb.

2856 to 2880 lb. 2



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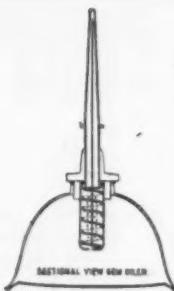
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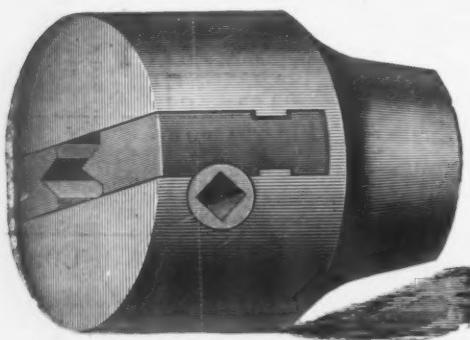
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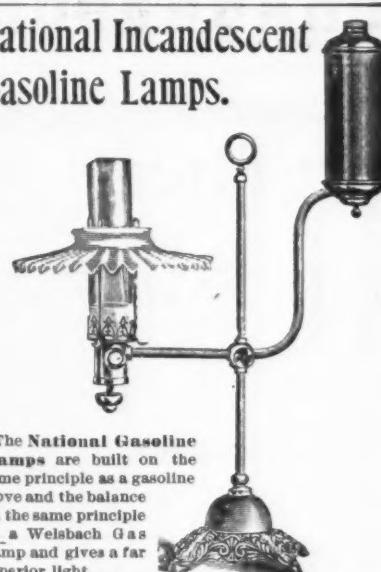
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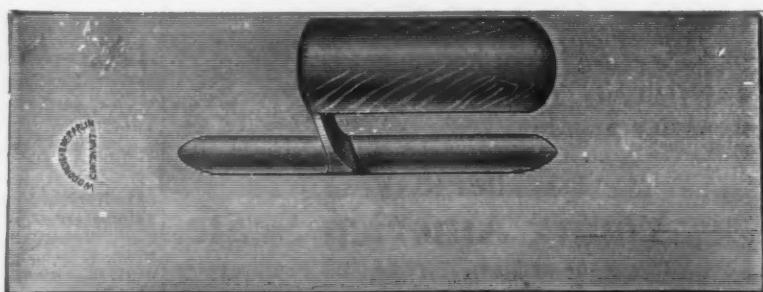
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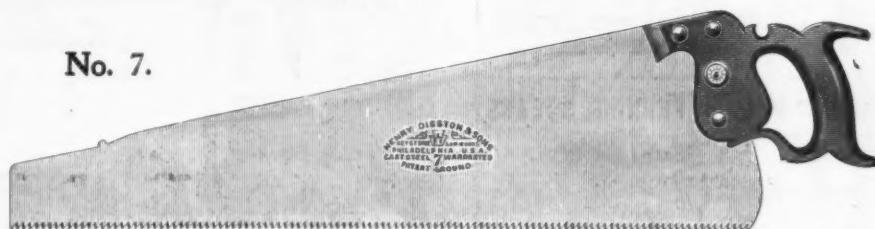
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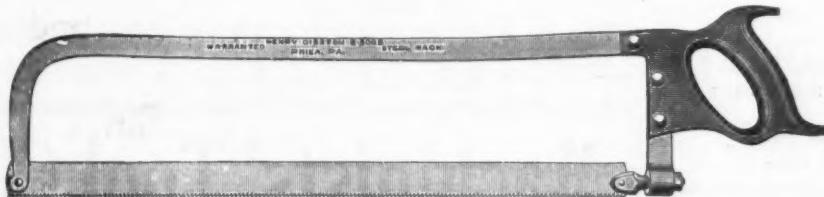
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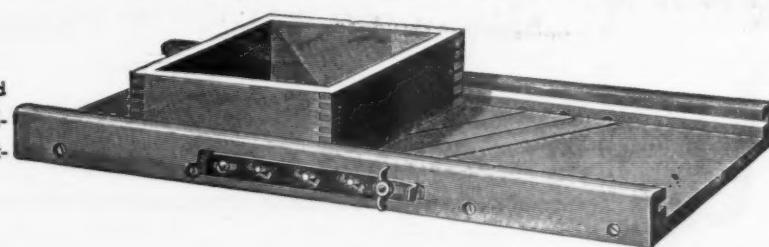
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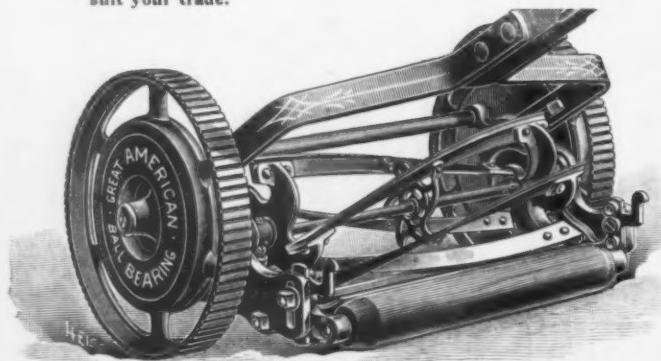


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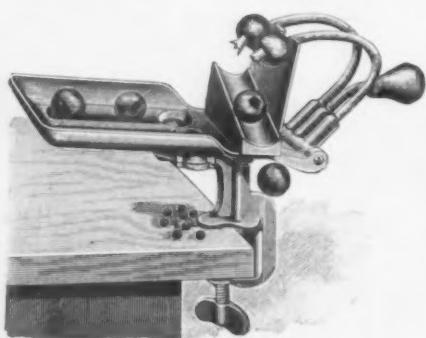
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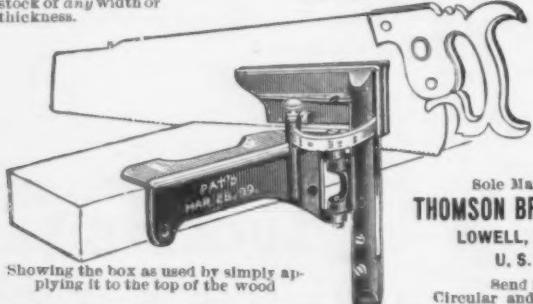
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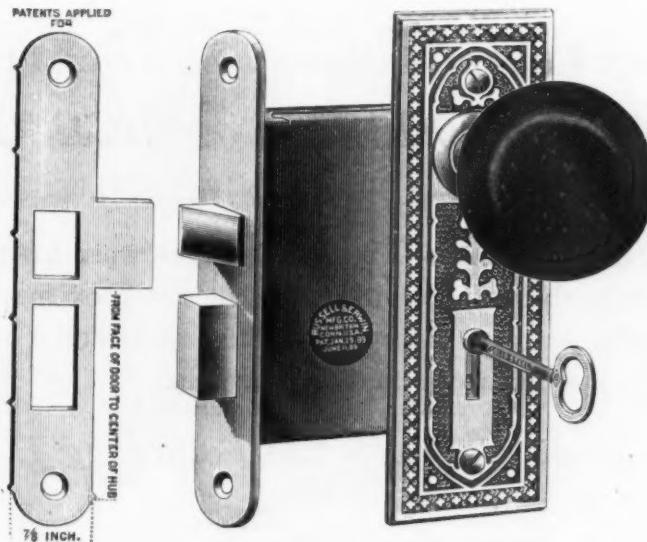
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Hand Bells	Running or Back Cart Chain	Spring Cotters	Spoons and Forks
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Leather Belting, Single	Safety and Plumbers' Chains	Carpenters' Mallets	Tacks
Rubber Belting	Basin, Bath and Wash Tray Chains	Machine Oilers	Carpet Tacks
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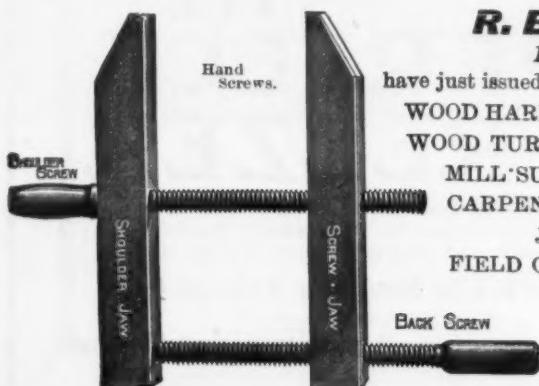


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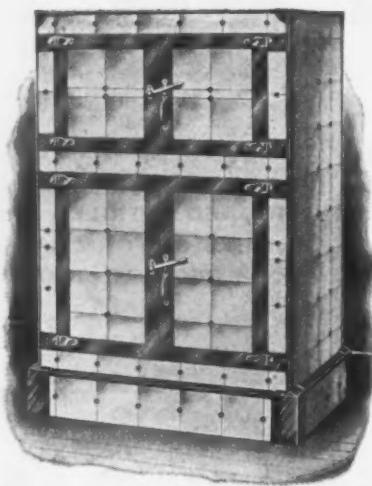
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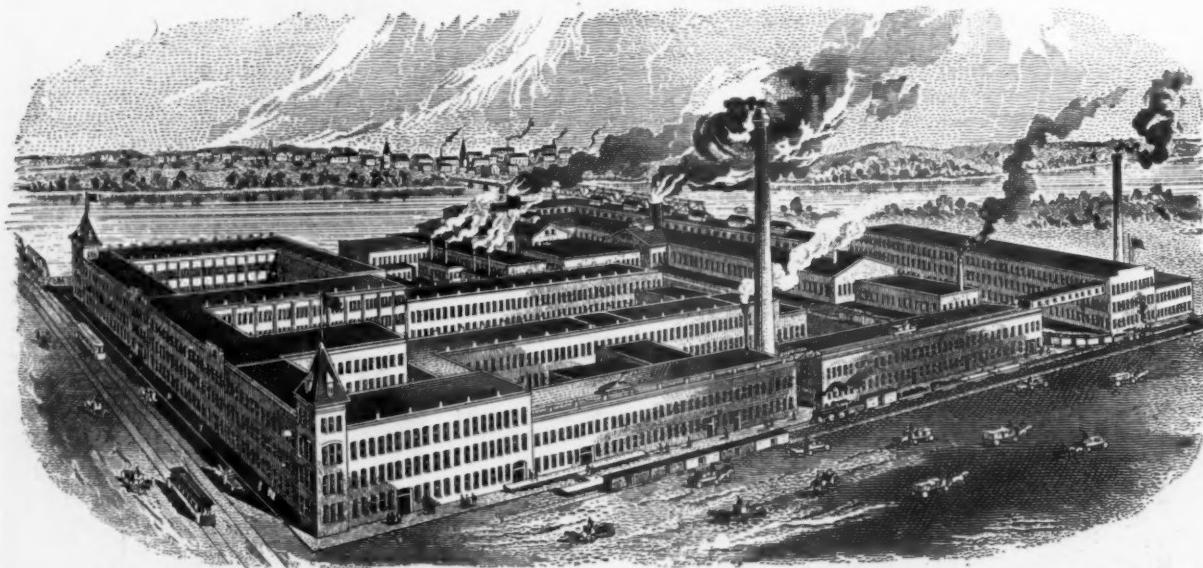


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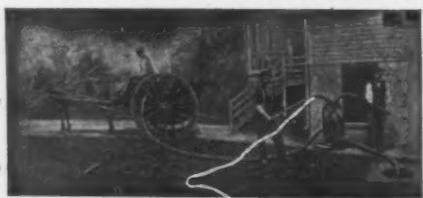
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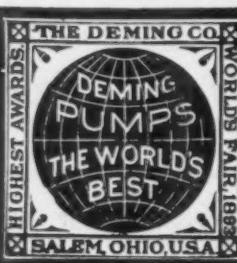
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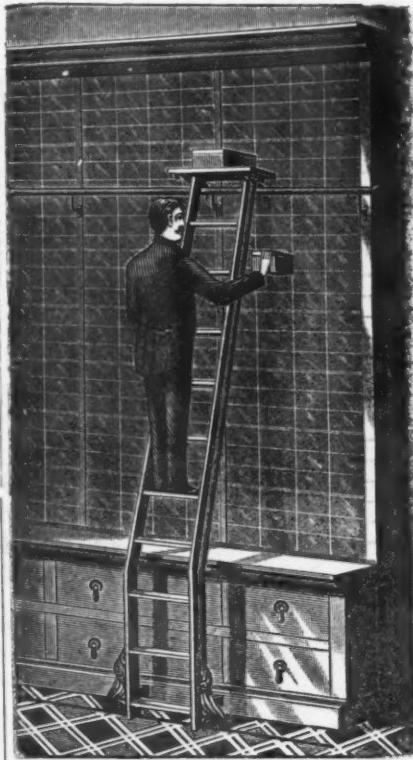
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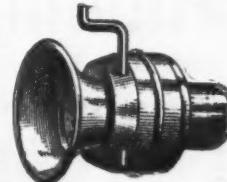


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always in stock. Send for new catalogue. Factory,  
Dekalb Ave. near Knickerbocker, Brooklyn, N. Y.



## "PRINCESS" Child's Tray.



The only Child's Tray that  
fully protects. Fitted closely  
around body of child, with high  
projection in front, it gives per-  
fect protection to the child and  
prevents soiling of table cloth  
or carpet.

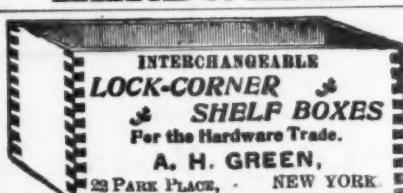
We make all descriptions of Pieced,  
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## Cast Brass Butt Hinges

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MANUFACTURERS OF  
BRASS, GALVANIZED & SHIP CHANDLERY  
HARDWARE.



INTERCHANGEABLE  
**LOCK-CORNER**  
**SHELF BOXES**  
For the Hardware Trade.  
**A. H. GREEN,**  
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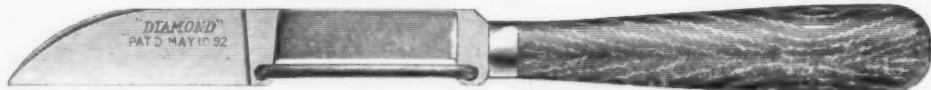
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ANY SIZES TO FIT YOUR  
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# Hardware Specialties



For information  
and prices  
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A CASH REGISTER selected from the various styles, either of the MONITOR or GUARDIAN type, will do the work of nine stores, restaurants, or barber shops, etc., out of every ten, better than any other costing five times as much as these or even more.

The Register separates the sales in any amounts from .01 to \$99.99 of any reasonable number of salesmen, as well as sales from departments, also amounts "Paid Out," "Paid on Account," or "Charge Sales."

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Nine different styles.

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It will pay

We can save the Hardwareman money.

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Write, and ask how.

We are not carpenters, but expert  
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*Masonic Temple Bldg., Chicago.*

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Manufactured by THE NORTON EMERY WHEEL CO., Worcester, Mass.



Stones even and clear grained throughout.

Remarkable cutting qualities.

Great strength of material.

Adaptability to all required shapes

**Every Stone Guaranteed.**

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THE Taintor Positive Saw  
Set 93 has every good  
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Sample, by mail, 25 cents.

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Cuts, Cleans and Files.

It is a neat, well made, nickel plated article. Put up attractively and sold cheaply. Send for circulars and prices.

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We make others.

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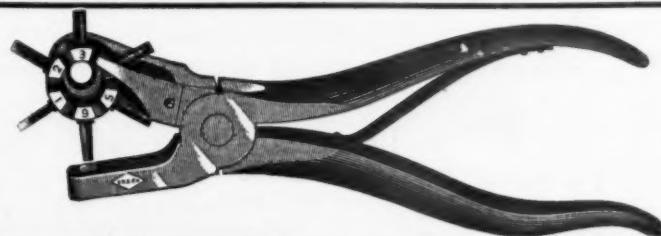
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Machinist's  
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MADE IN  
SPRINGFIELD  
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Springfield, Mass.,  
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No. 110 Copper for Sash of 400 lbs.
No. 10     "     "     "     " 250 "
No. 30     "     "     "     " 125 "
No. 40     "     "     "     " 75 "
No. 6 Steel
No. 60     "     "     "     "
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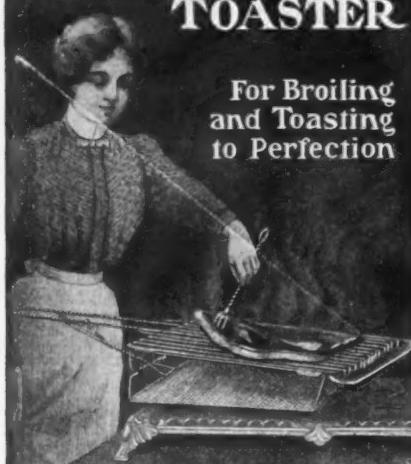
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Write for Catalogue of Hardware  
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No. 40.   No. 6.  
Actual Size.  
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# The IDEAL GAS BROILER & TOASTER

For Broiling  
and Toasting  
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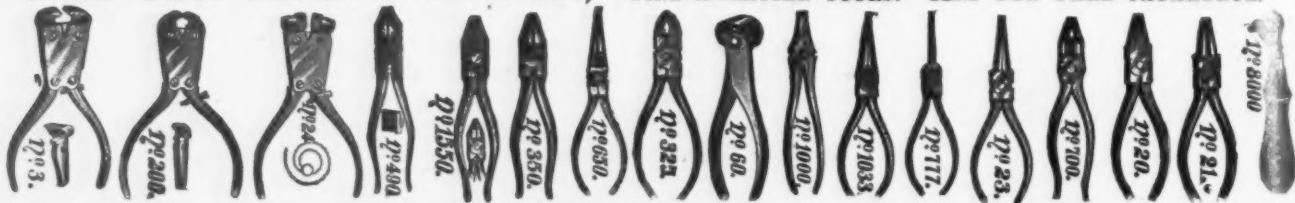
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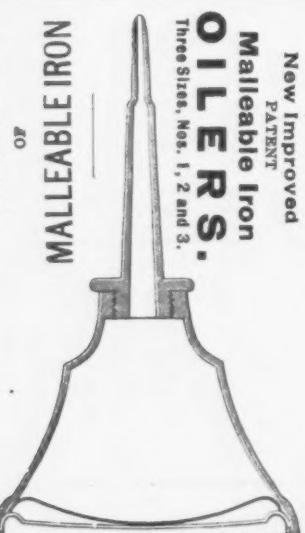
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**HARDWARE AND MECHANICS' TOOLS.**Patented Articles  
OFNew Improved  
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Malleable Iron  
Three Sizes, Nos. 1, 2 and 3.

**Hammer's** ADJUSTABLE CLAMPS.  
MALL. IRON HAND LAMPS.  
M. I. HANGING LAMPS.

New Pattern Heavy Screw Clamps.

Strongest in the market.

For Sale by all the Principal Hardware Dealers

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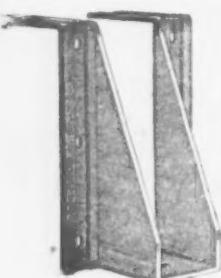
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of superior quality, and Hardware Specialties  
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**VAN DORN'S Steel  
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HAS NO EQUAL

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STRUCTURAL STEEL  
AND ORNAMENTAL IRON WORKERS.

**COES  
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The Genuine Improved  
**KNIFE HANDLE**  
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**SCREW WRENCHES.**Warranted to be the **BEST MADE** and  
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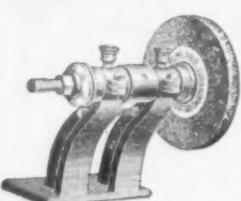
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Has a straight bar and extra long nut for  
screw in jaw.Send for Circular  
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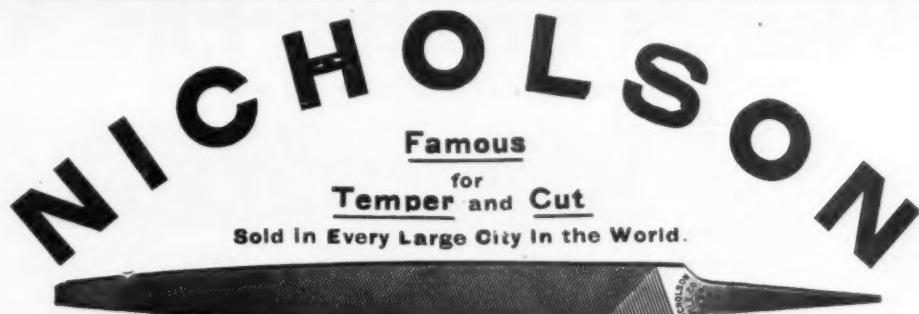
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Lawn Mower Grinding is a trick hard to  
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LARGEST MAKERS IN THE WORLD.

"BEST BY TEST."

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## Horse Rasps, Files and Farriers' Tools

Have been steadily IMPROVED in manufacture, kept constantly up to date and abreast with the TIMES. Their SUPERIOR QUALITY sets a known and tested STANDARD OF EXCELLENCE. Made from OUR OWN PRODUCTION of SPECIAL REFINED CLAY CRUCIBLE CAST STEEL and manufactured under machines of OUR OWN PATENTED CONSTRUCTION as well as TEMPERED by a SECRET PROCESS.

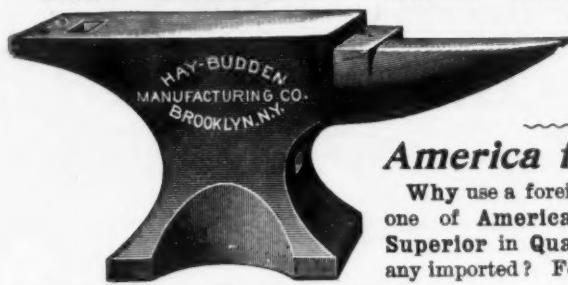


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FIRST MADE IN AMERICA....

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*America for Americans.*

Why use a foreign Anvill when you can get one of American manufacture, which is Superior in Quality, Form and Finish to any imported? For sale by all dealers.

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Die and Steel Forgings.  
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Superior to steel castings.

Our steel is made expressly and solely for us. Dies forged under our system will cut 10 to 25% more blanks than others before regrinding.



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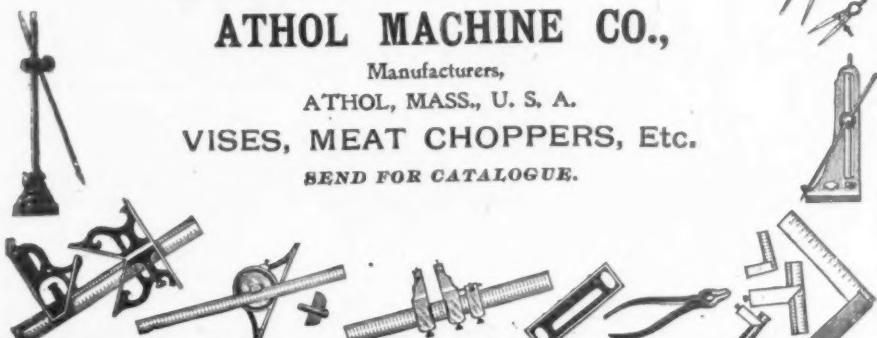
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VISES, MEAT CHOPPERS, Etc.

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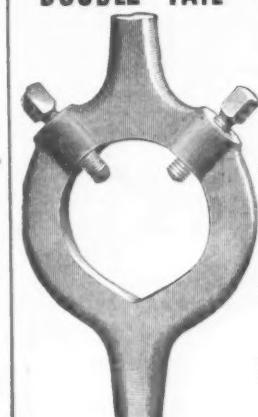
LE COUNT'S  
"DOUBLE TAIL" LATHE DOG.

Manufactured by

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Send for Catalogue  
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# The World's Greatest File Works.

ESTABLISHED 1842.



## THE ARCADE FILE WORKS

**THE ARCADE FILE WORKS** at Anderson, Indiana, is the largest and most completely equipped plant for the manufacture of Files in the world.

The highest inventive genius and mechanical talent has been concentrated on **ONE** Modern Plant, which is directed by master minds—originators of a distinctly improved product—machinery and methods up-to-date.

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Severance  
Centering Tool,

PRICE \$2.00

Combination  
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PRICE \$1.50 PER DOZ.

With these two tools you can center your work in two operations. It requires at least four in the old way.

Our Catalog for the asking.

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### COMBINATION TOOL.



Combination Wire Tool, Wire Cutter, Staple Puller, Screw Driver, Hammer, Nail Puller, Wire Splicer, Wire Stretcher—all in one.

Also Manufacturers of Gasoline Lamps

Dealers, Ask your Jobber or write us.  
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PATENT  
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Send for List of 500 DIES.

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Sole manufacturers of the celebrated  
**STOKES BROTHERS HORSE RASPS AND ST. CRISPIN SHOE RASPS**  
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**AWARDED BY THE NATIONAL EXPORT EXPOSITION TO**  
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PHILADELPHIA, PA.  
ON RECOMMENDATION OF THE FRANKLIN INSTITUTE  
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HIGHEST AWARD:  
SILVER MEDAL & DIPLOMA.

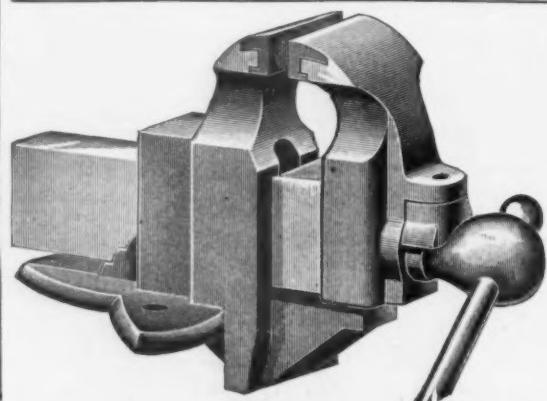
## THE ELGIN WRENCH.



Extra Jaw.

The best general purpose wrench on the market. It will turn a nut, hold a pipe or twist a rod. It is not clumsy, but flat and neat. It is the only adjustable wrench (with its range of work) that can be conveniently carried in the pocket. When jaws wear out, old ones can be replaced with new. Nickel plated and perfectly constructed. Write us for prices.

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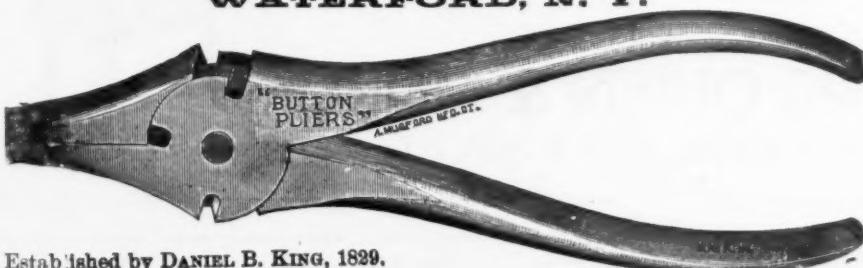
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Established by DANIEL B. KING, 1829.

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Manufacturers of  
**BUTTON'S**  
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AND PLIER COMBINED.

Specially Adapted for Use on Wire Fence.

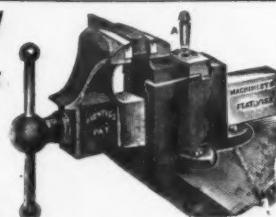
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MACHINISTS' STOCKS and DIES, PLUG and  
TAPER TAPS, HAND, NUT and SCREW TAPS,  
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Price-List on Application.



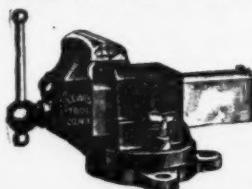
We make all  
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of Vises.

Descriptive Catalogue Free.



PRENTISS VISE CO., - 44 Barclay Street, New York.

Sole Agents for Great Britain: CHAR. NEAT &amp; CO., 112 Queen Victoria St., London, E. C.

**LEWIS PATENT QUICK-ACTING VISE**

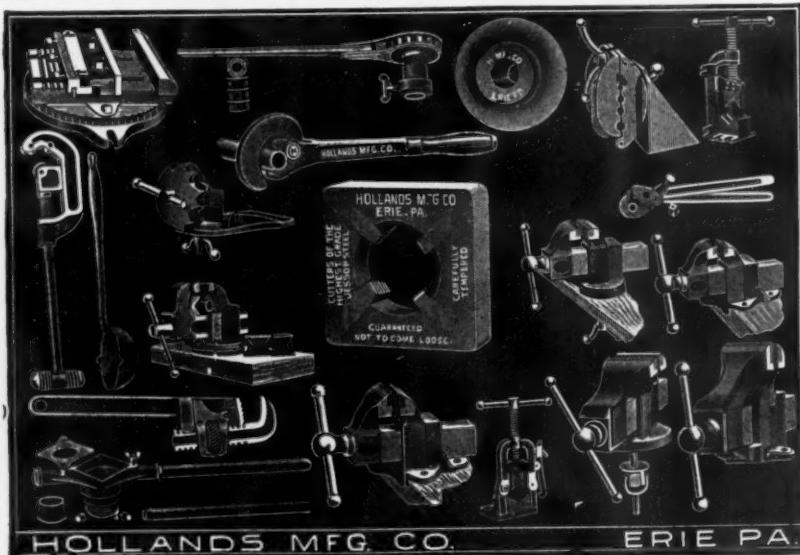
DURABLE, POWERFUL  
and TENACIOUS  
as any Screw Vise.

Commence to draw as soon as  
lever is started and have suffi-  
cient gether for any kind of  
work.



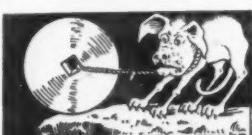
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Lewis Tool Co., 44 Barclay St., New York.

**Trimo Giant**

This Chain Pipe Wrench  
has interchangeable jaws. Improved method of  
holding and releasing chain. No locking. Send for  
catalog.

TRIMONT MFG. CO., Roxbury, Mass., U.S.A.



THE  
GREAT  
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**GRINDSTONES**

Is but little appreciated. They are  
adapted to grinding and finishing castings  
as well as for tool sharpening.

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LITTLE FERRY, Bergen Co., N. J.

Die Sinker, Steel

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Seals, Stencil Dies

for Stencil Cut-

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Badges and Medals, Key Checks, Door and Name

Plates, Experimental Work, etc.

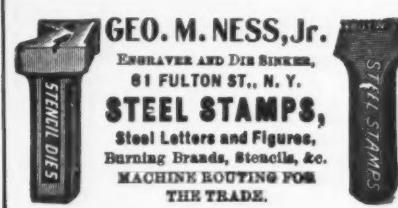
**GEO. M. NESS, Jr.**ENGRAVER AND DIE SINKER,  
61 FULTON ST., N. Y.**STEEL STAMPS,**

Steel Letters and Figures,

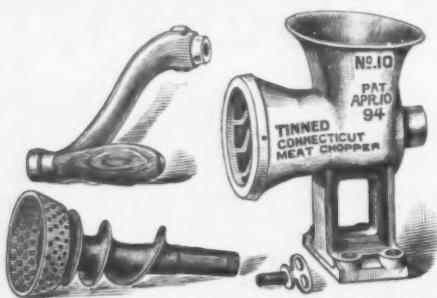
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MACHINE ROUTING FOR

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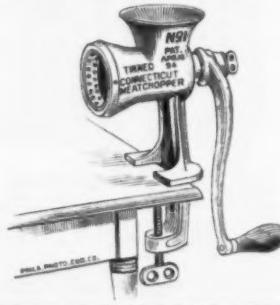
# CONNECTICUT MEAT CHOPPERS.



"ONLY TWO  
PARTS TO CLEAN."

Manufactured Exclusively by  
**O. D. WOODRUFF,**  
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Chicago Office, C. M. AVERY & CO. Direct Representative, No. 161  
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## The Peoria Washers



are the strongest, best made machines for the purpose on the market to day. They have **Cedar Tubs** with **Galvanized Hoops**. Inside castings, **Tinned Malleable Iron**. Leg brackets, malleable iron and bolted to tub with Tinned Bolts. Will wash as well as by hand, with less than  $\frac{1}{2}$  the labor.

Manufactured by  
**CLARK, QUIEN & MORSE,**  
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## CLAD'S Ice Cream Disher.



Seamless drawn steel cups.  
German silver knives (not tin).  
Improved key fastening, will not get loose.  
Improved handle.  
Capacities guaranteed standard.

PRICES ON APPLICATION.

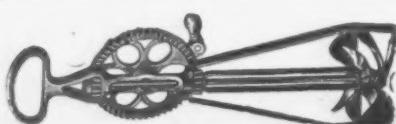
Address the original manufacturers,

**V. Clad & Sons,**

INCORPORATED.

119-121 South Eleventh St.

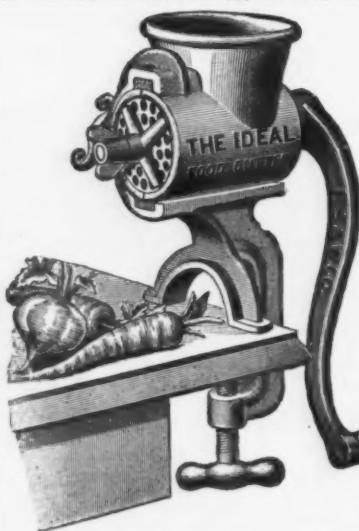
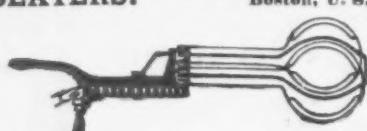
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153,052 lbs. of Iron and Steel have been made into  
Lyon Egg Beaters and Cream Whips. Send  
for New Price-List Circular.

Nelson Lyon, Sole Manuf., 52 Green St., Albany, N.Y.

**EGG BEATERS.** We make the largest line in the world. Send  
for samples and prices. **STANDARD CO.**  
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**The Ideal Food Cutter.**  
CUTS EVERYTHING EDIBLE.

CUTS FINE OR COARSE JUST AS NEEDED.

Cutting Parts are of Tempered Steel.

All Parts can be Duplicated.

THE MOST SATISFACTORY FAMILY  
MEAT AND FOOD CUTTER EVER  
MADE.

MANUFACTURED BY  
**THE PECK, STOW & WILCOX CO.,**  
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The Ideal Receipt Book Free upon  
Application.



## THE STERLING DUPLEX WASHER.

### THREE TO ONE!

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THE EUREKA CO.: Gentlemen.—In reply to yours of the 21st will say that I consider the Sterling Washer the best machine on the market to-day. I handle three other kinds of washing machines, and I sell three Sterlings to every one of the other machines.

Yours truly,

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This washer  
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convenient,  
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well made.

Has a trap  
door opening  
on top where  
water can be  
added or the  
clothes seen  
while the  
machine runs.

A patent hinge allows top  
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We make interesting prices.

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Rapid Grinding and Pulverizing Mills



No. 2½, \$4.50



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50 Sizes &amp; Styles for Hand &amp; Power from \$1.25 to \$125.00



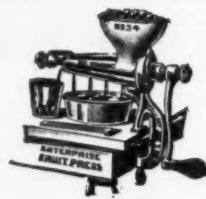
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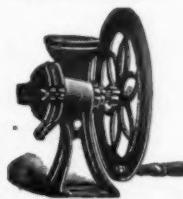
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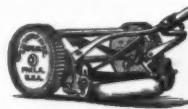
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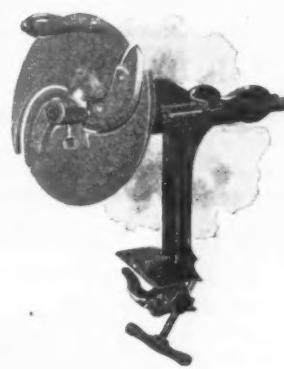
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WE OFFER to the trade for 1900 the finest line of BLUE FLAME COOKING STOVES ever seen. These are not "Wickless Wonders." They are our Wick Blue Flame Stoves that have been tried and tested for years. All mounted in handsome cabinet form.

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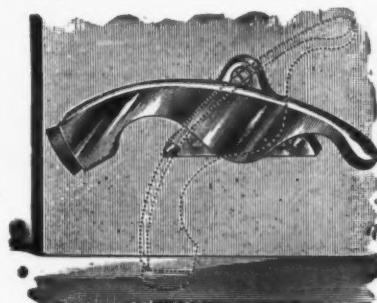
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has revolving  
steel ball  
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it noiseless;  
thus superior to others. Wheel  
continues one  
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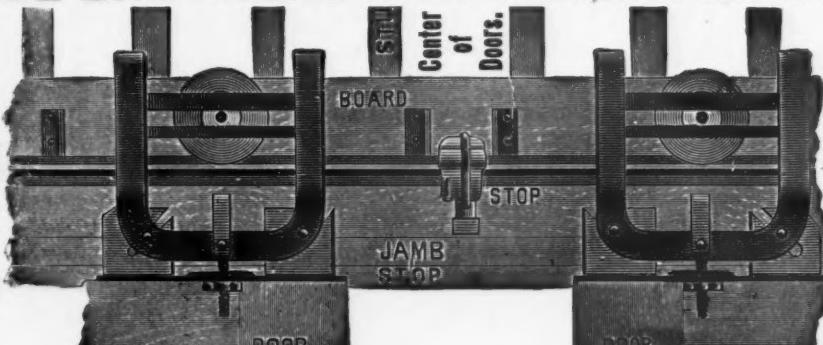


COST NO MORE THAN OLD STYLE.

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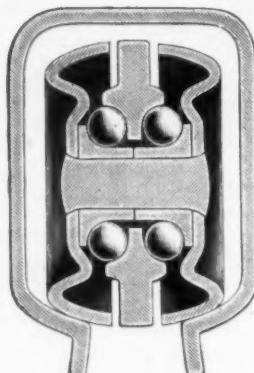


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Square and Round Weights. Hang exactly from centre. Only 10 inch pockets required. Eliminates use of lead weight.

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Cold Rolled Steel.  
Accurate in Construction.  
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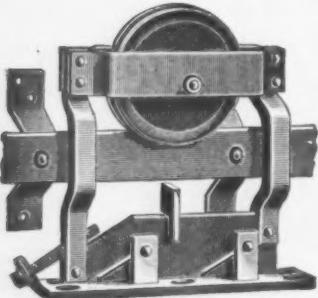
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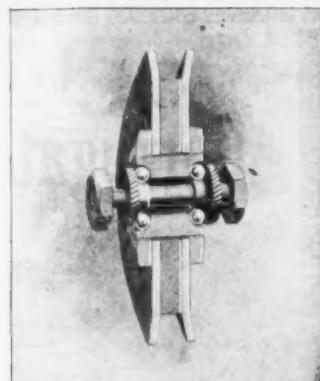
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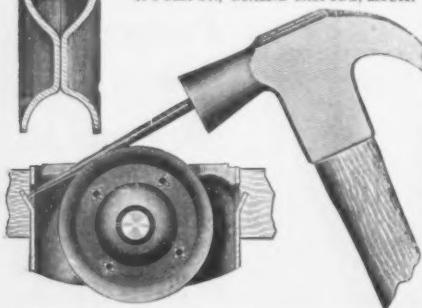
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This important feature is found only in  
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HARDWARE DEALERS  
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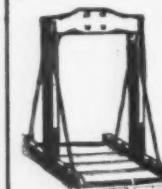
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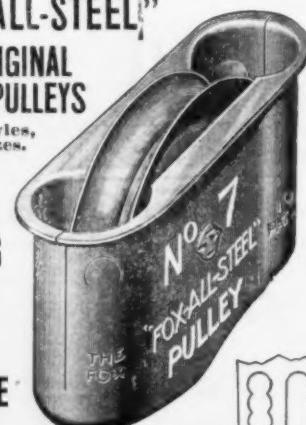
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ADAPTED TO ANY ONE'S USE.

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**"Bardsley" Checking Spring Hinge**

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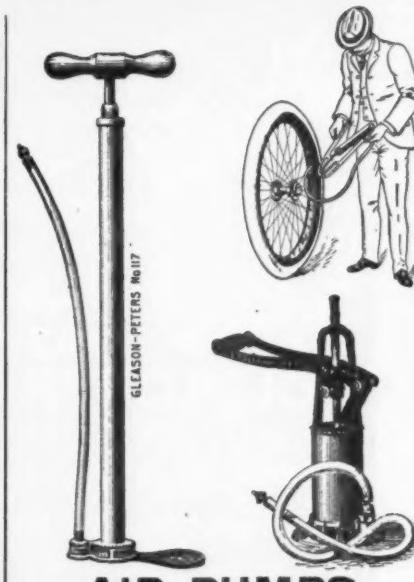
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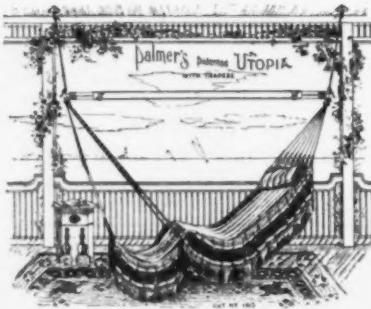
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**T**HE 25-20 MARLIN is one of the handiest arms made and accurate to 300 yards, with light report and little recoil. Its bullet is more reliable than a .22 calibre and the barrel does not foul as rapidly. It will kill cleanly and quickly without tearing. Smokeless powder can be used in a large variety of loads, and the ammunition is cheap.

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**Absolute Water Control.  
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Burns Liquid Carbide**

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One Tool for Two Gauges

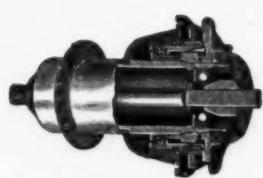
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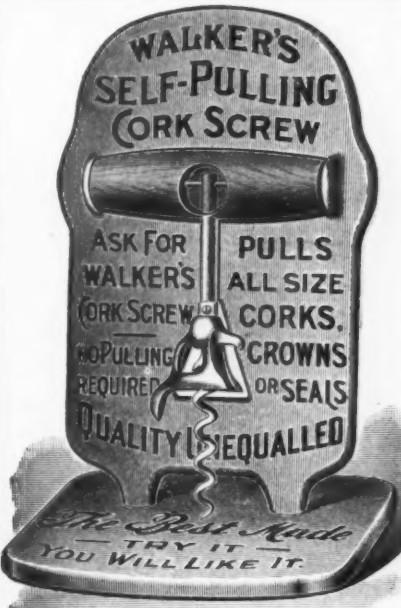
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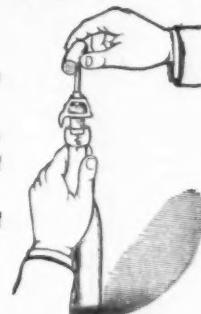
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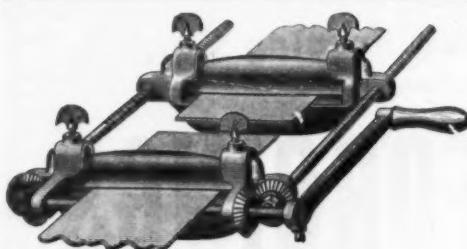
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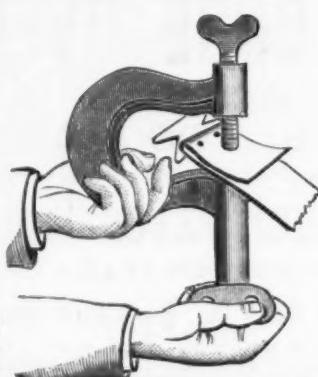
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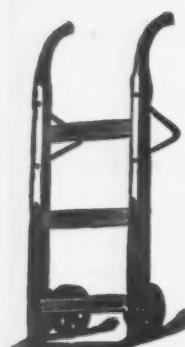
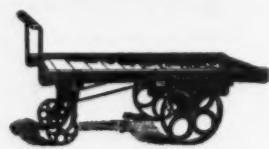
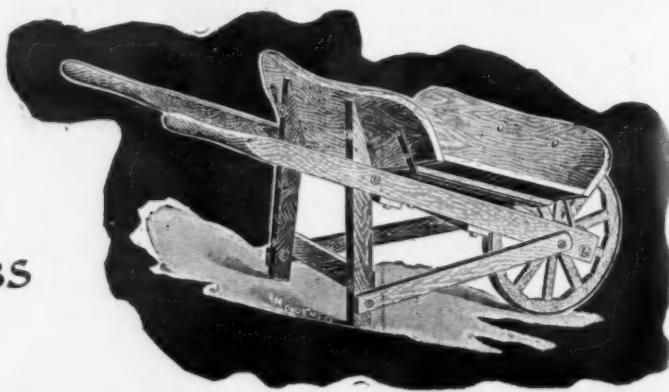
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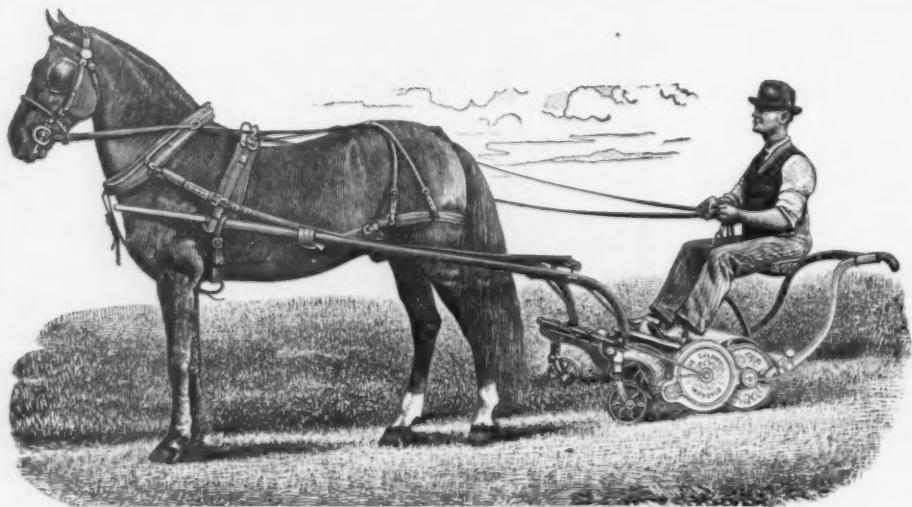


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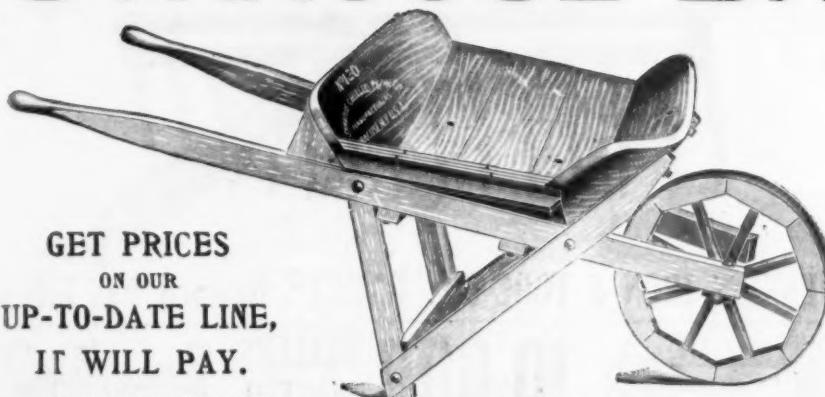
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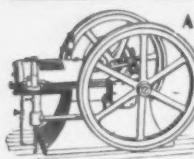
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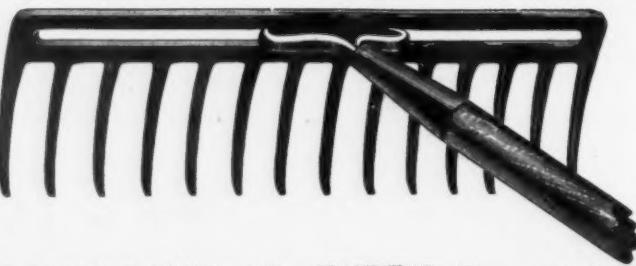
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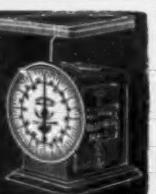
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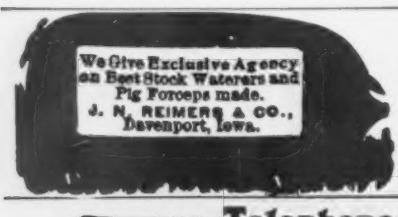
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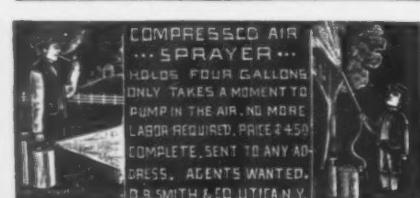
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Boston Blower Co.	68
Boston Bridge Works.	19
Boston Gear Works.	52
Boston & Lockport Block Co.	181
Botjer, C.	87
Box, Alfred & Co.	49
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Bradlee & Co.	27
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American Steel Hoop Co.	22
American Steel Scraper Co.	93-126
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American Tin Plate Co.	28
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American Tool Works Co.	71
Ames Sword Co.	42
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Arcade Mfg. Co.	5
Ashland Wire Co.	91
Ashton Valve Co.	42
Athol Machine Co.	117
Athol Pump Co.	107
Atkins, E. C. & Co.	98
Atlas Bolt & Screw Co.	41
Atlas Mfg. Co.	145
Atwater Mfg. Co.	114
Aultman Co.	48
Automatic Machine Co.	69
Avery Stamping Co.	98-108

**B**

Babcock & Wilcox Co.	46
Badger Brass Mfg. Co.	129
Baeder, Adamson & Co.	26
Baird, C. R. & Co.	31
Baird, U. Machinery Co.	84
Baker, Jas. H. Mfg. Co.	37
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Boles, J. E., Iron & Wire Works.	82

**C**

Cabeen & Co.	31
Cahall Sales Dept.	1-294
Caldwell Mfg. Co.	123
California Wire Works.	52
Canfield, H. O.	1
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Church, Isaac.	18
Cincinnati Corrugating Co.	5
Cincinnati Mch. Tool Co.	64
Cincinnati Milling Mch. Co.	70
Cleveland Railway Supply Co.	65
Clad, V. & Sons.	120
Clapp, E. D. Mfg. Co.	131
Clark, John W. Co.	108
Clark & Cowles.	3
Clark & Parsons Co.	4
Clark, W. J. Co.	145
Clark, J. R. Co.	109
Clark, Quisen & Morse.	120
Clay Stamping Co.	47
Clayton Air Compressor Wks.	47
Cleveland Ball & Screw Co.	66
Cleveland City Forge & Iron Co.	1
Cleveland Crane & Car Co.	63
Cleveland Elevator Bucket Co.	49
Cleveland Stamping & Tool Co.	48
Cleveland Stone Co.	119
Cleveland Twist Drill Co.	58
Cleveland Wire Spring Co.	5
Clinton Wire Cloth Co.	14
Cobb & Drew.	16
Coburn Trolley Track Mfg. Co.	124
Coe's Wrench Co.	116
Coldwell Lawn Mower Co.	184
Coleman Hardware Co.	107
Conn. Valley Mfg. Co.	97
Consolidated Iron & Steel Co.	25
Cook, A. D.	47
Cook, H. C. & Co.	118
Cook, Ass' S. & Co.	67
Cornell, J. B. & J. M.	46
Cochecton Rolling Mill Co.	26
Costillo, J. E. Mch. Wks.	53
Cotton, Barclay W. & Co.	82
Covert Mfg. Co.	135
Covert's Saddlery Works.	90
Cox, Justice, Jr. & Co., Ltd.	80
Cramp, Wm. & Sons S. & E. B. Co.	8
Cross & Spels Machine Co.	59
Cunliffe, R. M.	87
Curtis & Curtis.	61
Cushman Chuck Co.	66
Cutler-Hammer Mfg. Co.	53
D	46
Daimler Mfg. Co.	45
Dallett, Thos. H. & Co.	71
Dundy & Co.	25
Dame, Stoddard & Co.	127
Danielson Mch. & Tool Co.	83
D'Amour & Littledale Mch. Co.	63
Danville Bessemer Co.	20
Darby, Edw. & Sons.	14
Dart, E. M. Mfg. Co.	49
Davis, W. P. Machine Co.	67-82
Davis & Buxton Stamping Co.	127
Davol, John & Sons.	2
Dawson, A. L. & Co.	88
Defiance Mch. Wks.	68
DeKalb Fence Co.	11
Deming Co.	110
Demmas & Davis.	28
Detrick & Harvey Machine Co.	65
Diamond Drill & Mch. Co.	28
Diamond Tack & Nail Wks.	15
Dickinson, T. L.	55
Dieneit & Eisenhardt.	62
Dillon-Griswold Wire Co.	11
Dimmick, J. K. & Co.	32
Diston, Henry & Son.	99
Divine Bros. Co.	53
Dixon, Jos. Crucible Co.	48
Doan, J. B. & Co.	82
Dodge Machine Screw Co.	103
Dodge Mfg. Co.	51
Doebler Mfg. Co.	60
Donaldson & Newton.	87
Down Wire Works Co.	5-6
Dowling Co.	76
Dreyer Machine Tool Co.	76
Dudgeon, Richard.	62
Duff Patents Co.	40
Dunbar Bros.	6
Dunham Nut Co.	17
Dupont Mfg. Co.	75
Durant, W. N.	56
Dwiggins Wire Fence Co.	11
E	42
Eastern Forge Co.	35
Eastern Machinery Co.	50
Eccles, Richard.	133
Eclipse Bicycle Co.	129
Eckstein, C. G.	31
Eddy Electric Mfg. Co.	41
Edson Mfg. Co.	119
Egan Co.	50
Elmer & Amend.	45
Electric Controller & Supply Co.	47
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Empire Pipe Bending & Supply Co.	88
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Erie Specialty Co.	129
Erikson, Edw. E.	40
Estes, G. L.	26
Esteys Wire Works Co.	7
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Eucker, L. A. Stamp Wks.	119
Eureka Co.	120
Evans, G. F.	49
Everson, B. M.	85
Excelsior Needle Co.	146
Exeter Machine Works.	68
F	11
Fairmount Machine Co.	49
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Ferrante Mach. Co.	71
Ferro Carbon Casting Co.	36
Flier & Stowell Co.	43
Finished Steel Co.	25
Fish, H. C. Machine Works.	66
Fitch, W. & E. T. Co. The.	145
Fotton, Barclay W. & Co.	82
Covert's Saddlery Works.	90
Frost Wire Fence Co.	11
Fuller Mfg. Co.	57
Fulton Iron & Engine Works.	51
G	1
Gardner Bros.	36
Garland Chain Co.	108
Garrison, A., Foundry Co.	33
Garry Iron & Steel Roofing Co.	8
Garvin Machine Co.	74
Gas Stove Utensil Co.	115
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General Supply Co.	59
Geometric Drill Co.	36
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Gibson, Wm. D. Co.	5
Gilbert & Bennett Mfg. Co.	14
Gilmour, J.	38
Gleason-Peters Air Pump Co.	127
Gleason Tool Co.	146
Goepel & Baegener.	7
Goodell Co.	102
Goodell-Pratt Co.	104
Goodwin & Kintz Co.	92
Gorton, Geo., Machine Co.	55
Gothen Mfg. Co.	129
Gould & Eberhardt.	65
Graham, John H. & Co.	112
Grand Crossing Tack Co.	12&15
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Gray, Robt. J.	86
Green, A. H.	111
Greiner, F.	88
Griffin Mfg. Co.	101
Griffiths, Geo. Co.	136
Griswold Wire Co.	13
H	1
Hagen & Reid.	96
Haines Gauge Co.	35
Hale Bros.	108
Halk & Naumann.	3
Halls, Samuel, Sons.	13
Hamlin, Geo. R.	7
Hammer & Co.	116
Harrington, E. Son & Co.	54&76
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Harrison Safety Boiler Wks.	46
Hartford Steam Boiler Ins. and Ins. Co.	44
Hartigan, W. R.	96
Hartman Mfg. Co.	8
Harvey, Arthur C. Co.	27
Haskell, Wm. H. Mfg. Co.	18
Hawkins Co.	19
Hawthorne, E. H. Fire Brick Co.	38
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Hendry Machine Co.	94
Hendricks Bros.	2
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Hendryx, A. B. Co.	8
Hercules Steel Castings Co.	85
Heywood Bros. & Wakefield.	108
Hickman, W. H.	69
Hicks Bros. Williams & Co.	31
La Belle Steel Co.	29
Ladd, W. C.	20
Lamond, David.	40
Lands Tool Co.	35
Lane Brothers Co.	126
Lansing Wheelbarrow Co.	134
Lathrobe Steel Co.	45
L	1
Hertz, T. & Son	3
Hill, Henry F.	80
Hill, N. N. Brass Co.	127
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Hine-Watt Mfg. Co.	180
Hiltner, H. A. Sons.	84
Hobson, Houghton & Co.	29
Hoefer Mfg. Co.	63
Hotellerie, Theo. & Co.	95
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Howard Iron Works.	118
Howard & Morse.	7
Howson & Howson.	7
Hubbell, Harvey.	12
Huber, S. V. & Co.	40
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Hunt, C. W. Co.	49
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Hyde Bros. & Co.	87
I	1
Ideal Fuel Feeder Co.	44
Ideal Machine Works.	57
Ideal Mfg. Co.	129
Ideal Tool Co.	134
Illinois Steel Co.	37
Illinoia Zinc Co.	8
Imperial Bit & Snap Co.	181
Indianapolis Drop Forging Co.	34
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International Silver Co.	108
Iowa Farming Tool Co.	185
Iredell F. W.	42
Ironsides Co.	4
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Ives, H. B. & Co.	144
J	1
Jackson Flue Scraper Co.	44
Janney, Steinmetz & Co.	7
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Jeffrey Mfg. Co.	49
Jenkins, E. Mfg. Co.	18
Jenkins Bros.	1
Jenkins Iron & Tool Co.	126
Jenkinson, R. C. & Co.	6
Jennings, C. E. & Co.	100
Jennings, Russell Mfg. Co.	101
Jesson, Wm. & Sons.	28
Johnson, I. H., Jr. & Co.	65
Johnson, Iver, Arms & Cycle Works.	145
Johnson, Wm. C. & Sons Mch. Co.	84
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Jones, Jesse Paper Box Co.	11
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Jones & Laughlins, Ltd.	89
K	1
Kanneberg Roofing Co.	18
Keeley, Jerome & Co.	80
Keen & Hagerty Mfg. Co.	111
Kelley, B. F. & Son.	83
Kennedy, Julian.	34
Kennedy, Walter.	40
Kennedy Valve Mfg. Co.	146
Kerrick, J. H.	81
Keystone Drop Forge Works.	49
Kids Bros. & Burgher Steel Wire Co.	20
Kidder, R. E.	65
Kilborn & Bishop Co.	37
Kilbourne & Jacobs Mfg. Co.	134
Kilmer Wire Mfg. Co.	11
Kimball, C.	

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Mianus Electric Co.	186	Ossawan Mills Co.	145	Patterson, F. L.	52	Syracuse Chilled Plow Co.	135		
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Heald, L. S. & Son, Barre, Mass.  
Sellers, Wm. & Co., Inc., Phila., Pa.  
Washburn Shops of Worcester Poly-  
technic Inst., Worcester, Mass.
- Drilling Machines**  
Barber, E. F. Co., Rockford, Ill.  
Burres, W. F. & John Co., Rockford, Ill.  
Bausch & Lomb Mch. Tool Co., Spring  
field, Mass.
- Bickford Drill & Tool Co., Cin., Ohio.  
Bullard Machine Tool Co., Bridgeport,  
Ct.  
Burnham, Geo. Co., Worcester, Mass.  
Champion Blower & Forge Co., Lancas-  
ter, Pa.
- Cincinnati Mch. Tool Co., Cincinnati, O.  
Dallett, Thos. H. & Co., Philadelphia.  
D'Amour & Littlefield Mch. Co., 131  
Worth St., N. Y.
- Davis, W. P., Machine Co., Rochester,  
N. Y.
- Detrick & Harvey Mch. Co., Baltimore,  
Md.
- Harrington, E. Son & Co., Phila., Pa.  
Hill, Clarke & Co., Boston, Mass.  
Hoefer Mfg. Co., Freeport, Ill.
- Pratt & Whitney, Worcester, Mass.
- Quinn, J. D., Hartford, Conn.
- Sibley & Ware, So. Bend, Ind.
- Sigourney Tool Co., Hartford, Conn.
- Silver Mch. Co., Salem, O.
- Slate Dwight Machine Co., Hartford,  
Ct.
- Stow Flexible Shaft Co., Phila., Pa.
- Willey & Russell Mfg. Co., Greenfield,  
Mass.
- York, S. M. Co., Cleveland, O.
- Drilling Machines, Automatic**  
Gould & Eberhardt, Newark, N. J.
- Drills, Pneumatic**  
Chicago Pneumatic Tool Co., Chicago,  
Ill.
- Drop Forgings**  
Belden Machine Co., New Haven, Conn.  
Billings & Spencer Co., Hartford, Conn.  
Chicago Drop Forging & Fdry. Co.,  
Kensington, Ill.
- Clapp, E. D. Mfg. Co., Auburn, N. Y.  
Eccles, Richard, Auburn, N. Y.
- Indianapolis Drop Forging Co., Indian-  
apolis, Ind.
- Kilbourn Corp. Forge Co., Philadelphia,  
Pa.  
Kilbourn & Bishop Co., New Haven, Conn.  
R. I. Tool Co., Providence, R. I.  
Scranton Forging Co., Scranton, Pa.  
Seward, M. & Son Co., New Haven, Ct.  
Springfield Drop Forging Co., Spring-  
field, Mass.
- Strieby & Fonte Co., Newark, N. J.  
Tranau & Williams Co., Allendale, O.  
Williams, J. H. & Co., Brooklyn, N. Y.  
Wymar & Gordon, Worcester, Mass.
- Drop Hammers**  
Billings & Spencer Co., Hartford, Conn.  
Merrill Bros., Brooklyn, N. Y.  
Williams, White & Co., Moline, Ill.
- Drop Presses**  
Manville, E. J. Mch., Co., Waterbury, Ct.  
Miner & Peck Mfg. Co., New Haven, Ct.  
Mossberg & Granville Mfg. Co., Prov-  
idence, R. I.  
Vulcan Iron Works, Chicago, Ill.
- Dumb Waiters**  
Energy Mfg. Co., Philadelphia, Pa.  
Speidel, J. G., Reading, Pa.
- Eddy Electric Mfg. Co.**  
General Electric Co., Schenectady, N. Y.
- Eave Troughs**  
Kanneberg Rtg. Co., Canton, O.
- Eave Trough Hangers**  
Berger Bros. Co., Philadelphia, Pa.  
Oatman Bros., Medina, O.
- Edge Tools**  
Buck, Chas., Millbury, Mass.  
Buck Bros., Millbury, Mass.  
Ferro-Carbon Casting Co., Phila., Pa.  
White, L. & J. Co., Buffalo, N. Y.
- Egg Beaters**  
Lyon, Nelson, Albany, N. Y.  
Standard Co., Boston, Mass.
- Egg Opener**  
Hartigan, W. R., Collinsville, Ct.
- Electric Bells and Supplies**  
Ostrander, W. R. & Co., 294 Fulton St.
- Electric Controllers**  
Cutler-Hammer Mfg. Co., Milwaukee,  
Wis.
- Diamonds**  
Mendes Cutting Factories, 51-53 Malden  
Lane, N. Y.
- Diamond Tools**  
Dickinson, Thos. L., 45 Vesey St., N. Y.
- Dies**  
Adriance Mach. Works, Brooklyn, N. Y.  
Bliss, E. W. Co., Brooklyn, N. Y.  
Ferracuti Mach. Co., Bridgeport, N. J.  
Hay-Budden Mfg. Co., Brooklyn, N. Y.  
Mossberg, Frank Co., Attleboro, Mass.  
Richard Mfg. Co., Bloomington, Pa.  
Wilson & Smith, Worcester, Mass.
- Door Bells.—See Bells and Gongs.**
- Door Checks and Springs**  
Bardeley, Jos., 147 151 Baxter St., N. Y.  
Pullman Safe Balance Co., Rochester,  
N. Y.
- Russell & Erwin Mfg. Co., New York.  
Toler, John, Sons & Co., Newark, N. J.
- Door Holders**  
Brohard Co., Phila., Pa.  
Caldwell Mfg. Co., Rochester, N. Y.
- Draught Springs**  
Burritt & Williams, Boston, Mass.
- Draw Benches**  
Richard Mfg. Co., Bloomsburg, Pa.  
Thompson, Hugh L., Waterbury, Ct.
- Drawing Stands**  
Allen, D. H. & Co., Miamisburg, O.
- Drill Grinders**  
Fuller Mfg. Co., Kalamazoo, Mich.  
Heald, L. S. & Son, Barre, Mass.  
Sellers, Wm. & Co., Inc., Phila., Pa.  
Washburn Shops of Worcester Poly-  
technic Inst., Worcester, Mass.
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Burres, W. F. & John Co., Rockford, Ill.  
Bausch & Lomb Mch. Tool Co., Spring  
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- Bickford Drill & Tool Co., Cin., Ohio.  
Bullard Machine Tool Co., Bridgeport,  
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Burnham, Geo. Co., Worcester, Mass.  
Champion Blower & Forge Co., Lancas-  
ter, Pa.
- Cincinnati Mch. Tool Co., Cincinnati, O.  
Dallett, Thos. H. & Co., Philadelphia.  
D'Amour & Littlefield Mch. Co., 131  
Worth St., N. Y.
- Davis, W. P., Machine Co., Rochester,  
N. Y.
- Detrick & Harvey Mch. Co., Baltimore,  
Md.
- Harrington, E. Son & Co., Phila., Pa.  
Hill, Clarke & Co., Boston, Mass.  
Hoefer Mfg. Co., Freeport, Ill.
- Pratt & Whitney, Worcester, Mass.
- Quinn, J. D., Hartford, Conn.
- Sibley & Ware, So. Bend, Ind.
- Sigourney Tool Co., Hartford, Conn.
- Silver Mch. Co., Salem, O.
- Slate Dwight Machine Co., Hartford,  
Ct.
- Stow Flexible Shaft Co., Phila., Pa.
- Willey & Russell Mfg. Co., Greenfield,  
Mass.
- York, S. M. Co., Cleveland, O.
- Drilling Machines, Automatic**  
Gould & Eberhardt, Newark, N. J.
- Drills, Pneumatic**  
Chicago Pneumatic Tool Co., Chicago,  
Ill.
- Drop Forgings**  
Belden Machine Co., New Haven, Conn.  
Billings & Spencer Co., Hartford, Conn.  
Chicago Drop Forging & Fdry. Co.,  
Kensington, Ill.
- Clapp, E. D. Mfg. Co., Auburn, N. Y.  
Eccles, Richard, Auburn, N. Y.
- Indianapolis Drop Forging Co., Indian-  
apolis, Ind.
- Kilbourn Corp. Forge Co., Philadelphia,  
Pa.  
Kilbourn & Bishop Co., New Haven, Conn.  
R. I. Tool Co., Providence, R. I.  
Scranton Forging Co., Scranton, Pa.  
Seward, M. & Son Co., New Haven, Ct.  
Springfield Drop Forging Co., Spring-  
field, Mass.
- Strieby & Fonte Co., Newark, N. J.  
Tranau & Williams Co., Allendale, O.  
Williams, J. H. & Co., Brooklyn, N. Y.  
Wymar & Gordon, Worcester, Mass.
- Drop Hammers**  
Billings & Spencer Co., Hartford, Conn.  
Merrill Bros., Brooklyn, N. Y.  
Williams, White & Co., Moline, Ill.
- Drop Presses**  
Manville, E. J. Mch., Co., Waterbury, Ct.  
Miner & Peck Mfg. Co., New Haven, Ct.  
Mossberg & Granville Mfg. Co., Prov-  
idence, R. I.  
Vulcan Iron Works, Chicago, Ill.
- Dumb Waiters**  
Energy Mfg. Co., Philadelphia, Pa.  
Speidel, J. G., Reading, Pa.
- Eddy Electric Mfg. Co.**  
General Electric Co., Schenectady, N. Y.
- Eave Troughs**  
Kanneberg Rtg. Co., Canton, O.
- Eave Trough Hangers**  
Berger Bros. Co., Philadelphia, Pa.  
Oatman Bros., Medina, O.
- Edge Tools**  
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Buck Bros., Millbury, Mass.  
Ferro-Carbon Casting Co., Phila., Pa.  
White, L. & J. Co., Buffalo, N. Y.
- Egg Beaters**  
Lyon, Nelson, Albany, N. Y.  
Standard Co., Boston, Mass.
- Egg Opener**  
Hartigan, W. R., Collinsville, Ct.
- Electric Bells and Supplies**  
Ostrander, W. R. & Co., 294 Fulton St.
- Electric Controllers**  
Cutler-Hammer Mfg. Co., Milwaukee,  
Wis.
- Diamonds**  
Mendes Cutting Factories, 51-53 Malden  
Lane, N. Y.
- Diamond Tools**  
Dickinson, Thos. L., 45 Vesey St., N. Y.
- Dies**  
Adriance Mach. Works, Brooklyn, N. Y.  
Bliss, E. W. Co., Brooklyn, N. Y.  
Ferracuti Mach. Co., Bridgeport, N. J.  
Hay-Budden Mfg. Co., Brooklyn, N. Y.  
Mossberg, Frank Co., Attleboro, Mass.  
Richard Mfg. Co., Bloomington, Pa.  
Wilson & Smith, Worcester, Mass.
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- Door Checks and Springs**  
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- Russell & Erwin Mfg. Co., New York.  
Toler, John, Sons & Co., Newark, N. J.
- Door Holders**  
Brohard Co., Phila., Pa.  
Caldwell Mfg. Co., Rochester, N. Y.
- Draught Springs**  
Burritt & Williams, Boston, Mass.
- Draw Benches**  
Richard Mfg. Co., Bloomsburg, Pa.  
Thompson, Hugh L., Waterbury, Ct.
- Drawing Stands**  
Allen, D. H. & Co., Miamisburg, O.
- Drill Grinders**  
Fuller Mfg. Co., Kalamazoo, Mich.  
Heald, L. S. & Son, Barre, Mass.  
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Hoefer Mfg. Co., Freeport, Ill.
- Pratt & Whitney, Worcester, Mass.
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- Sibley & Ware, So. Bend, Ind.
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- Slate Dwight Machine Co., Hartford,  
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- Stow Flexible Shaft Co., Phila., Pa.
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Billings & Spencer Co., Hartford, Conn.  
Chicago Drop Forging & Fdry. Co.,  
Kensington, Ill.
- Clapp, E. D. Mfg. Co., Auburn, N. Y.  
Eccles, Richard, Auburn, N. Y.
- Indianapolis Drop Forging Co., Indian-  
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- Kilbourn Corp. Forge Co., Philadelphia,  
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Kilbourn & Bishop Co., New Haven, Conn.  
R. I. Tool Co., Providence, R. I.  
Scranton Forging Co., Scranton, Pa.  
Seward, M. & Son Co., New Haven, Ct.  
Springfield Drop Forging Co., Spring-  
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- Strieby & Fonte Co., Newark, N. J.  
Tranau & Williams Co., Allendale, O.  
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Wymar & Gordon, Worcester, Mass.
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Williams, White & Co., Moline, Ill.
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Mossberg & Granville Mfg. Co., Prov-  
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Vulcan Iron Works, Chicago, Ill.
- Dumb Waiters**  
Energy Mfg. Co., Philadelphia, Pa.  
Speidel, J. G., Reading, Pa.
- Eddy Electric Mfg. Co.**  
General Electric Co., Schenectady, N. Y.
- Eave Troughs**  
Kanneberg Rtg. Co., Canton, O.
- Eave Trough Hangers**  
Berger Bros. Co., Philadelphia, Pa.  
Oatman Bros., Medina, O.
- Edge Tools**  
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Buck Bros., Millbury, Mass.  
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- Egg Beaters**  
Lyon, Nelson, Albany, N. Y.  
Standard Co., Boston, Mass.
- Egg Opener**  
Hartigan, W. R., Collinsville, Ct.
- Electric Bells and Supplies**  
Ostrander, W. R. & Co., 294 Fulton St.
- Electric Controllers**  
Cutler-Hammer Mfg. Co., Milwaukee,  
Wis.
- Diamonds**  
Mendes Cutting Factories, 51-53 Malden  
Lane, N. Y.
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Ferracuti Mach. Co., Bridgeport, N. J.  
Hay-Budden Mfg. Co., Brooklyn, N. Y.  
Mossberg, Frank Co., Attleboro, Mass.  
Richard Mfg. Co., Bloomington, Pa.  
Wilson & Smith, Worcester, Mass.
- Door Bells.—See Bells and Gongs.**
- Door Checks and Springs**  
Bardeley, Jos., 147 151 Baxter St., N. Y.  
Pullman Safe Balance Co., Rochester,  
N. Y.
- Russell & Erwin Mfg. Co., New York.  
Toler, John, Sons & Co., Newark, N. J.
- Door Holders**  
Brohard Co., Phila., Pa.  
Caldwell Mfg. Co., Rochester, N. Y.
- Draught Springs**  
Burritt & Williams, Boston, Mass.
- Draw Benches**  
Richard Mfg. Co., Bloomsburg, Pa.  
Thompson, Hugh L., Waterbury, Ct.
- Drawing Stands**  
Allen, D. H. & Co., Miamisburg, O.
- Drill Grinders**  
Fuller Mfg. Co., Kalamazoo, Mich.  
Heald, L. S. & Son, Barre, Mass.  
Sellers, Wm. & Co., Inc., Phila., Pa.  
Washburn Shops of Worcester Poly-  
technic Inst., Worcester, Mass.
- Drilling Machines**  
Barber, E. F. Co., Rockford, Ill.  
Burres, W. F. & John Co., Rockford, Ill.  
Bausch & Lomb Mch. Tool Co., Spring  
field, Mass.
- Bickford Drill & Tool Co., Cin., Ohio.  
Bullard Machine Tool Co., Bridgeport,  
Ct.  
Burnham, Geo. Co., Worcester, Mass.  
Champion Blower & Forge Co., Lancas-  
ter, Pa.
- Cincinnati Mch. Tool Co., Cincinnati, O.  
Dallett, Thos. H. & Co., Philadelphia.  
D'Amour & Littlefield Mch. Co., 131  
Worth St., N. Y.
- Davis, W. P., Machine Co., Rochester,  
N. Y.
- Detrick & Harvey Mch. Co., Baltimore,  
Md.
- Harrington, E. Son & Co., Phila., Pa.  
Hill, Clarke & Co., Boston, Mass.  
Hoefer Mfg. Co., Freeport, Ill.
- Pratt & Whitney, Worcester, Mass.
- Quinn, J. D., Hartford, Conn.
- Sibley & Ware, So. Bend, Ind.
- Sigourney Tool Co., Hartford, Conn.
- Silver Mch. Co., Salem, O.
- Slate Dwight Machine Co., Hartford,  
Ct.
- Stow Flexible Shaft Co., Phila., Pa.
- Willey & Russell Mfg. Co., Greenfield,  
Mass.
- York, S. M. Co., Cleveland, O.
- Drilling Machines, Automatic**  
Gould & Eberhardt, Newark, N. J.
- Drills, Pneumatic**  
Chicago Pneumatic Tool Co., Chicago,  
Ill.
- Drop Forgings**  
Belden Machine Co., New Haven, Conn.  
Billings & Spencer Co., Hartford, Conn.  
Chicago Drop Forging & Fdry. Co.,  
Kensington, Ill.
- Clapp, E. D. Mfg. Co., Auburn, N. Y.  
Eccles, Richard, Auburn, N. Y.
- Indianapolis Drop Forging Co., Indian-  
apolis, Ind.
- Kilbourn Corp. Forge Co., Philadelphia,  
Pa.  
Kilbourn & Bishop Co., New Haven, Conn.  
R. I. Tool Co., Providence, R. I.  
Scranton Forging Co., Scranton, Pa.

- Foot Pumps.** Gleason-Peters Air Pump Co., Houston and Mercer Sta., N. Y.
- Foot Rests.** Star Heel Plate Co., Newark, N. J.
- Forges, Portable, &c.** Bradley Co., Syracuse, N. Y.; Champion Blower & Forge Co., Lancaster, Pa.; Sturtevant, B. F. Co., Boston, Mass.
- Forgings, Iron and Steel.** Baker, Jas. H. Mfg. Co., Pittsburgh, Pa.; Bethlehem Steel Co., S. Bethlehem, Pa.; Columbus Forge & Iron Co., Columbus, O.; Eastern Forge Co., Boston, Mass.; Frankford Steel Co., Phila., Pa.; Hay-Budden Mfg. Co., Brooklyn, N. Y.; Otis Steel Co., Ltd., Cleveland, Ohio; Pittsburgh Shear, Knife & Machine Co., Pittsburgh, Pa.; Titusville Forge Co., Titusville, Pa.; U. S. Projectile Co., Brooklyn, N. Y.
- Forks, Hay and Manure.** Iowa Farming Tool Co., Ft. Madison, Ia.; Withington & Cooley Mfg. Co., Jackson, Mich.
- Foundry Facings.** Obermayer, S. Co., Cincinnati, O.
- Foundry Lamps.** Forest City Foundry & Mfg. Co., Cleveland, Ohio; Paxson, J. W. Co., Phila., Pa.
- Foundry Molasses.** Tuasig, N. W. & Co., 111 Wall St., N. Y.
- Foundry Supplies.** Gilmour, J. T., Bennett Building, N. Y.; Obermayer, S. Co., Cincinnati, O.; Osborn Mfg. Co., Cleveland, O.; Paxson, J. W. Co., Phila., Pa.; Poinier & Lester, Toledo, O.; Tansig, N. W. & Co., 111 Wall St., N. Y.
- Friction Clutches.** Eastern Machinery Co., New Haven, Ct.
- Furnaces, Oil, Gas and Coal.** Rockwell Engineering Co., 26 Cortlandt St., N. Y.
- Fuses.** Ensign Bickford & Co., Simsbury, Ct.
- Gages.** Crosby Steam Gage & Valve Co., Boston.
- Galvanized Ware.** Keen & Hagerty Mfg. Co., Baltimore.
- Galvanizing.** Blackman & King, 801 Greenwich St., N. Y.; Empire Pipe Bending & Supply Co., Brooklyn, N. Y.
- Galvanizing Process.** U. S. Electro Galvanizing Co., 349 Broadway, N. Y.
- Garden Rakes.** Jenkins Iron & Tool Co., Howard, Pa.
- Garden Tools.** Withington & Cooley Mfg. Co., Jackson, Mich.
- Gas Broiler.** Gas Stove Utensil Co., 73 Murray St., N. Y.
- Gas Compositometer.** Uehling, Steinbart & Co., Ltd., Carlstadt, N. J.
- Gas Compressors.** Norwalk Iron Works Co., So. Norwalk, Conn.
- Gas Furnaces.** Chicago Flexible Shaft Co., Chicago, Ill.
- Gaskets.** Canfield, H. O., Bridgeport, Conn.
- Gaskets, Iron.** Smooth On Mfg. Co., Jersey City, N. J.
- Gas Producers.** Duff & Sons Co., Allegheny, Pa.; Smythe, S. R. Co., Inc., Pittsburgh, Pa.; Swindell, W. & Bro., Pittsburgh, Pa.
- Gauges, Rolling Mill.** Haines Gauge Co., Philadelphia, Pa.
- Gears.** Boston Gear Works, Boston, Mass.; Cresson, Geo. V. Co., Philadelphia, Pa.; Gleason Tool Co., Rochester, N. Y.; Morse, Williams & Co., Phila., Pa.; Nuttal, R. D. Co., Allegheny, Pa.; Poole, Robt. Son & Co., Baltimore, Md.
- Gears, Rawhides.** Horshburgh & Scott, Cleveland, Ohio; Hazel & Bassett, Phila., Pa.
- Gear Cutters.** Becker-Brainard Milling Machine Co., Hyde Park, Mass.; Gould & Eberhardt, Newark, N. J.; Whiton, D. E. Mch. Co., New London, Ct.
- Glass Cutters.** Barrett, W. L., Bristol, Conn.; Bultman, F. H. & Co., Cleveland, O.; Monce, S. G., Unionville, Conn.
- Glass Cutting Boards.** Lufkin Rule Co., Saginaw, Mich.
- Glue.** Baeder, Adamson & Co., Phila., Pa.
- Golf Goods.** Bridgeport Gun Implement Co., 813 Broadway, N. Y.
- Grates, Rocking.** Sennett, Geo. B. Co., Youngstown, O.
- Grinding and Polishing Mch's.** American Emery Wheel Works, Providence, R. I.; Barnes, W. F. & John Co., Rockford, Ill.; Brown & Sharpe Mfg. Co., Providence; Builders Iron Foundry, Providence, R. I.; Cincinnati Milling Mach. Co., Cincinnati, O.; Fullmer Mfg. Co., Kalamazoo, Mich.; Gleason, Geo. Mach. Co., Racine, Wis.; Landis Tool Co., Waynesboro, Pa.; Northampton Emery Wheel Co., Leeds, Mass.; Norton Emery Wheel Co., Worcester, Mass.; Safety Emery Wheel Co., Springfield, O.; Springfield Mfg. Co., Bridgeport, Conn.
- Star Corundum Wheel Co., Detroit, Mich.**
- Tanite Co., Stroudsburg, Pa.**
- Universal Mach Co., Providence, R. I.**
- Whitney Mfg. Co., Hartford, Conn.**
- Grindstones.** Cleveland Stone Co., Cleveland, O.
- Guns.** Hopkins & Allen Arms Co., Norwich, Ct.; Marlin Fire Arms Co., New Haven, Ct.; Remington Arms Co., 315 Broadway, New York
- Gymnasium Apparatus.** Narragansett Mch. Co., Providence, R. I.
- Hack Saws.** Dleton, Henry & Sons, Inc., Phila., Pa.; Goodell-Pratt Co., Greenfield, Mass.; Springfield Machine Screw Co., Springfield, Mass.
- Starrett, L. S. Co., Athol, Mass.**
- Hammers.** Heller Bros. Co., Newark, N. J.; Logan & Strobridge Iron Co., New Brighton, Pa.
- Hammers, Pneumatic.** Chicago Pneumatic Tool Co., Chicago, Ill.; Q & C Co., Chicago, Ill.
- Hammocks.** Palmer, L. E., Middletown, Conn.; Blackwell Hdw. Co., Janesville, Wis.
- Hand Milling Machines.** Costello, J. E. Machine Wks., Brooklyn, N. Y.
- Hand Screws.** Bliss, R. Mfg. Co., Pawtucket, R. I.
- Hangers, Barn Door.** Coleman Hardware Co., Chicago, Ill.
- Hangers, Door.** Courtn Trolley Track Mfg. Co., Hol- yoke, Mass.
- Lane Bros., Poughkeepsie, N. Y.**
- Leavenworth Bros., Sterling, Ill.**
- Louden Machinery Co., Fairfield, Iowa.**
- McCabe Hanger Mfg. Co., 533-543 W. 22d Street, N. Y.**
- McKinley Mfg. Co., Allegheny, Pa.**
- Ney Mfg. Co., Canton, Ohio.**
- Stowell Mfg. & Foundry Co., So. Milwaukee, Wis.**
- Wilcox Mfg. Co., Aurora, Ill.**
- Hangers, Shafting.** Ball Bearing Co., Boston, Mass.; Dodge Mfg. Co., Mishawaka, Ind.; Machinists Supply Co., Rochester, N. Y.
- Hardware Comm'rs Merchants.** Graham, Jno. H. & Co., 113 Chambers St., N. Y.; Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Hardware Manufacturers.** Arcade Mfg. Co., Freeport, Ill.; Coleman Hardware Co., Chicago, Ill.; Logan & Strobridge Iron Co., New Brighton, Pa.
- Millers Falls Co., 25 Warren St., N. Y.**
- Ney Mfg. Co., Canton, Ohio.**
- Parker, Chas., Co., Meriden, Conn.**
- Peck Stow & Wilcox Co., 27 Murray St., N. Y.**
- Russell & Ervin Mfg. Co., New York.**
- Shepard, Sidney & Co., Buffalo, N. Y.**
- Stanley Works, New Britain, Conn.**
- Suppice Hdw. Co., Phila., Pa.**
- Union Mfg. Co., 103 Chambers St., N. Y.**
- Van Wagner & Williams Hdw. Co., Cleveland, O.**
- Wrightsville Hdw. Co., Wrightsville, Pa.**
- Hardware Mfrs' Agents.** Graham, John H. & Co., 113 Chambers St., N. Y.
- Webb & Hilger, Ltd., 9-15 Murray St., N. Y.**
- Hardware Specialty.** Acme Shear Co., Bridgeport, Conn.; Berger Bros. Co., Philadelphia, Pa.; Chanfrell Tool Co., Reading, Pa.; Enterprise Mfg. Co., of Pa., Phila., Pa.; Graham, John H. & Co., 113 Chambers St., N. Y.
- Peck Mfg. Co., Allegheny, Pa.**
- Hay Knives.** Clark & Parsons Co., E. Wilton, Me.; Ney Mfg. Co., Canton, Ohio.
- Hay Slings.** Gothen Mfg. Co., Goshen, Ind.
- Hay Tools.** Louden Machinery Co., Fairfield, Iowa; Myers, F. E. & Bro., Ashland, O.; Ney Mfg. Co., Canton, O.
- Heating and Ventilating Apparatus.** American Blower Co., Detroit, Mich.; Bell, Wm. & Sons Co., Milwaukee, Wis.
- Benton Blower Co., Hyde Park, Mass.**
- Buffalo Forge Co., Buffalo, N. Y.**
- Perkins, B. F. & Son, Holyoke, Mass.**
- Sturtevant, B. F. Co., Boston, Mass.**
- Heel Plates.** Star Heel Plate Co., Newark, N. J.
- Hinges.** Lawrence Bros., Sterling, Ill.; McKinley Mfg. Co., Allegheny, Pa.; Stanley Works, New Britain, Conn.; Tiebout, W. & J., 118 Chambers St., N. Y.
- Hitching Posts.** Hartman Mfg. Co., 309 Broadway, N. Y.
- Hoes, Garden Planters, &c.** Iowa Farming Tool Co., Fort Madison, Iowa.
- Jenkins Iron & Tool Co., Howard, Pa.**
- Hoists, Air.** Pedrick & Ayer Co., Philadelphia, Pa.; Ridgway, Craig & Son Co., Coatesville, Pa.
- Hoists, Chain and Rope.** Fox, Alfred & Co., Philadelphia, Pa.; Chisholm & Moore Mfg. Co., Cleveland, Ohio.
- Eckstein, C. G., 249 Centre St., N. Y.**
- Fulton Iron & Engine Works, Detroit, Mich.**
- Harrington, E. Son & Co., Phila., Pa.**
- McCoy, Jos. F. & Co., 26 Warren St., Reading Crane & Hoist Works, Reading, Pa.**
- Speldel, J. G., Reading, Pa.**
- Hoisting Machines.** Eastern Machinery Co., New Haven, Ct.; Lidgerwood Mfg. Co., 96 Liberty St., N. Y.
- Hollow Mill.** Geometric Drill Co., Westville, Conn.
- Hollow Ware.** Avery Stamping Co., Cleveland, Ohio; Cleveland Stamping & Tool Co., Cleveland, O.
- New York Stamping Co., Brooklyn, N. Y.**
- Rogers Jno. M. Boat-Gauge & Drill Works, Gloucester, City, N. J.**
- Horse Nails.** Capewell Horse Nail Co., Hartford, Ct.; Mooney, W. M. & Co., Ausable Chasm, N. Y.
- National Horse Nail Co., Vergennes, Vt.**
- Purman Nail Co., Neponset, Boston, Mass.**
- Wiebusch & Hilger, Ltd., 9-15 Murray St., N. Y.**
- Horse and Mule Shoes.** Burden Iron Co., Troy, N. Y.; Phenix Horse Shoe Co., Poughkeepsie, N. Y.
- Rhode Island Perkins Horse Shoe Co., Providence, R. I.**
- Horseshoe Studs.** Leonhart & Co., Berlin, Schoneberg, Germany.
- Hose.** Boston Belting Co., Boston, Mass.; Peerless Rubber Mfg. Co., 16 Warren Street, New York.
- Hose Couplings.** Clark, W. J. & Co., Salem, Ohio.
- Hose Coupling, Air.** Pedrick & Ayer Co., Philadelphia, Pa.
- Hose Washers.** Canfield, H. O., Bridgeport, Conn.
- House Furnishing Specialties.** Williams, A. C., Ravenna, O.
- Hydrants.** Reading Fdry. Co., Reading, Pa.
- Hydraulic Jacks.** Dodge, Richard, 24 Columbia St., N. Y.; Watson-Stillman Co., 204 E. 43d St., N. Y.
- Hydraulic Machinery.** U. S. Projectile Co., Brooklyn, N. Y.; Watson-Stillman Co., 204 E. 43d St., N. Y.
- Hydraulic Tools.** Watson-Stillman Co., 204 E. 43d St., N. Y.; Wood, R. D. & Co., Phila., Pa.
- Ice Cream Dishes.** Glad, V. & Sons, Phila., Pa.; Seavey Mfg. Co., Boston, Mass.
- Ice Cream Freezers.** North Bros. Mfg. Co., Philadelphia, Pa.; Tatums, Sam'l C. Co., Cincinnati, O.; White Mountain Freezer Co., Nashua, N. H.
- Ice Making Machinery.** York Mfg. Co., York, Pa.
- Ice Pick.** Don Machine Screw Co., Boston, Mass.
- Ice Shredders.** Enterprise Mfg. Co., Philadelphia, Pa.; Erie Specialty Co., Erie, Pa.
- Ice Tools.** Gorlach, Peter & Co., Cleveland, O.; Williams, A. C., Ravenna, O.; Wood, Wm. T. & Co., Arlington, Mass.
- Injectors.** Jenkins Bros., New York.
- Insurance, Boiler.** Hartford Steam Boiler Inspection and Insurance Co., Hartford, Conn.
- Iron and Steel, Swedish.** Harvey, Arthur C. Co., Boston, Mass.; Lillenberg, N., 150 Broadway, N. Y.; Milne, A. & Co., 1 Broadway, N. Y.; Potts, Horace T. & Co., Phila., Pa.
- Iron Commission Brokers.** Cabeen & Co., Phila., Pa.; Cotton, Bache & Co., Ltd., Phila., Pa.; Cox, Justice, Jr., Phila., Pa.; Eddings, J. W., Phila., Pa.; Kelleher, Jerome & Co., Philadelphia, Pa.; Law, Ernest & Co., Phila., Pa.; Lewis, Henry & Co., Philadelphia; Lea, J. Tatnall & Co., Philadelphia; Mohr, J. J., 430 Walnut St., Philadelphia; Thomas, Theodore, Utica, N. Y.; Wister, L. R. & Co., Phila., Pa.
- Iron Manufacturers.** Newkirk, J. B. & Co., Philadelphia, Pa.; Republic Iron & Steel Co., Chicago, Ill.
- Merchants.** Bole, Ross & Co., Pittsburgh, Pa.; Cotton, Barclay W. & Co., Phila., Pa.; Cunliffe, R. M., Phila., Pa.; Law, Ernest & Co., Phila., Pa.; McInnes, C. E. & Co., Phila., Pa.; Ogden & Wallace, 577-583 Greenwich St., N. Y.
- Pierson & Co., 29 Broadway, N. Y.**
- Potts, Horace T. & Co., Phila., Pa.**
- Thompson, W. H. & Co., Milwaukee, Wis.**
- Wallace, Wm. H. & Co., 66 Broadway, N. Y.**
- Wheeler, Mifflin & Co., Phila., Pa.**
- Wilson, E. H. & Co., Philadelphia.**
- Importers.** Whealock-Lovejoy & Co., New York and Boston.
- Iron, Galvanized Sheet—See Sheets, Galvanized.**
- Iron, Sheet—See Sheets, Iron and Steel.**
- Iron Ore.** Nicoll, B. & Co., 68 Wall St., N. Y.
- Pulling & Crane, Phila., Pa.**
- Pullman, J. Wealey, Phila., Pa.**
- Iron Putty.** Morgan & Wright, Chicago, Ill.
- Ironwork, Ornamental.** Adam, W. J., Joliet, Ill.; Barnum, E. T., Detroit, Mich.; Van Dorn Iron Wks. Co., Cleveland, O.
- Japanning.** Warner Bros. Co., Bridgeport, Conn.
- Job Lots, Hardware.** Chicago House Wrecking Co., Chicago, Ill.
- Joist Hanger.** National Iron & Wire Co., Cleveland, O.; Van Dorn Iron Wks. Co., Cleveland, O.
- Kegs.** Bell, Edwin & Sons Co., Youngstown, O.
- Keys, Machine.** Morton Mfg. Co., Muskegon Heights, Mich.; Whitney Mfg. Co., Hartford, Ct.
- Knives.** Kimball, C. J. Co., Bennington, N. H.
- Ladders.** Goshen Mfg. Co., Goshen, Ind.
- Lamps.** Miller, Edward & Co., Meriden, Ct.
- Lamps, Gasoline.** Metropolitan Daylight Lamp Co., Chicago, Ill.
- Lamp Stoves.** National Specialty Mfg. Co., Rockford, Ill.
- Lasts and Last Stands.** Kuperle, Jno. C., St. Louis, Mo.; Pleurer & Henger Mfg. Co., St. Louis, Mo.; Stowell Mfg. & Foundry Co., So. Milwaukee, Wis.
- Lathe Dogs.** LeCount, Wm. G., So. Norwalk, Conn.
- Lathe.** American Tool Works Co., Cincinnati, Ohio; Barker-Chard Mch. Tool Co., Cincinnati, Ohio.
- Barnes, B. F. & Co., Rockford, Ill.**
- Bement, Miles & Co., Phila., Pa.**
- Brown & Sharpe Mfg. Co., Providence, R. I.**
- Bullard Mach. Tool Co., Bridgeport, Ct.**
- Davis, W. P. Machine Co., Rochester, N. Y.**
- Defiance Mch. Works, Defiance, O.**
- Draper Mch. Tool Co., Worcester, Mass.**
- Fish, H. C. Mch. Wrks., Worcester, Mass.**
- Harrington, E. Son & Co., Phila., Pa.**
- Johnson, Israel H., Jr., & Co., Phila., Pa.**
- Jones & Lamson Mch. Co., Springfield, Vt.**
- Lodge & Shipley Mch. Tool Co., Cincinnati, O.**
- McGabe, J. J., 14 Dey St., N. Y.**
- New Haven Mfg. Co., New Haven, Ct.**
- Potter & Johnson Co., Pawtucket, R. I.**
- Pratt & Whitney Co., Hartford, Conn.**
- Prentiss Bros., Worcester, Mass.**
- Seneca Falls Mfg. Co., Seneca Falls, N. Y.**
- Young, W. C. Mfg. Co., Worcester, Mass.**
- Lathing, Wire.** Clinton Wire Cloth Co., Clinton, Mass.; N. J. Wire Cloth Co., Trenton, N. J.; Wright & Colton Wire Cloth Co., Worcester, Mass.
- Lawn Mowers.** Coldwell Lawn Mower Co., Newburgh, N. Y.; Supplee Hardware Co., Phila., Pa.
- Lawn Mower Sharpeners.** Wilcox Mfg. Co., Aurora, Ill.; Zacharias & Co., Asbury Park, N. J.
- Lawn Sprinklers.** Crescent Brass & Iron Co., Detroit, Mich.; Kuperle, Jno. C., St. Louis, Mo.; McGowan, John H. Co., Cincinnati, O.; Pleurer & Henger Mfg. Co., St. Louis, Mo.
- Lawn Swings.** Goshen Mfg. Co., Goshen, Ind.
- Lemon Squeezers.** Hagen & Reid, Troy, N. Y.; Logan & Strobridge Iron Co., New Brighton, Pa.; Williams, A. C., Ravenna, O.
- Lockers.** Narragansett Mch. Co., Providence, R. I.
- Locks and Knobs.** Reading Hdw. Co., Reading, Pa.; Russell & Ervin Mfg. Co., New York; U. S. Steel Lock Co., Clinton, Iowa.
- Locomotives.** Everson, B. M., Pittsburgh, Pa.
- Logging Tools.** Gerlach, Peter & Co., Cleveland, Ohio.
- Lubricants.** Dixon, Jno., Crucible Co., Jersey City, N. J.
- Lumbering Tools.** Morley Bros., Saginaw, Mich.
- Lunch Boxes.** Seavey Mfg. Co., Boston, Mass.
- Machinery.** Acme Machinery Co., Cleveland, Ohio; Ajax Mfg. Co., Cleveland, Ohio; American Tool Wks. Co., Cincinnati, O.; Baird, U. Machinery Co., Pittsburgh, Pa.; Barnes, W. F. & John Co., Rockford, Ill.; Baugh & Harris Mch. Tool Co., Springfield, Mass.; Becker-Brainard Milling Mach. Co., Hyde Park, Mass.; Benjamin, Miles & Co., Philadelphia, Pa.; Bissell E. W. Co., Brooklyn, N. Y.; Brigg, Marvin, 12 Broadway, N. Y.

- Brown & Sharpe Mfg. Co., Providence.  
 Bullard Mch. Tool Co., Bridgeport Ct.  
 Carter Machinery & Supply Co., Allegheny, Pa.  
 Clevlin's Sons Thos., Allegheny, Pa.  
 Chesley Machinery Co., Havemeyer  
 Bldg., N. Y.  
 Cincinnati Milling Mach. Co., Cin. O.  
 Cornell, J. B. & J. M., 28th St. and 11th  
 Ave., New York City.  
 Davis, W. P. Machine Co., Rochester,  
 N. Y.  
 Dawson, A. L. & Co., Chicago, Ill.  
 Detrich Harvey Mch. Co., Baltimore,  
 Md.  
 Diamond Drill & Mch. Co., Birdsboro  
 Pa.  
 Doan, J. B. & Co., Chicago, Ill.  
 Draper Mach. & Tool Co., Worcester Mass.  
 Farrel F'dr'g & Mch. Co., Ansonia, Conn.  
 Ferrocute Machine Co., Bridgeton, N. J.  
 Field & C. Machine Works, Worcester,  
 Mass.  
 Garvin Machine Co., Spring and Varick  
 Sts., N. Y.  
 General Supply Co., 40 John St., N. Y.  
 Geometric Drill Co., Westville, Conn.  
 Gray, Robt. J., 52-54 E. 183d St., N. Y.  
 Hender Machine Co., Torrington, Conn.  
 Hill, Henry F., Boston, Mass.  
 Hill, Clarke & Co., Boston, Mass.  
 Johnson, Israel H., Jr., & Co., Phila.  
 Johnson, Wm. C. & Sons Mch. Co., St.  
 Louis Mo.  
 Kerrick, J. H., Minneapolis, Minn.  
 Kettner & Smith Mch. Tool Co., Cin. O.  
 McCaffrey, J. J., 14 Dear Street, N. Y.  
 McDowell Stocked & Co., Chicago.  
 Keagy & Lear Mch. Co., Coshocton, O.  
 Manning, Maxwell & Moore, 85-89 Lib-  
 ery St., N. Y.  
 Manville, E. J. Mach. Co., Waterbury, Ct.  
 Marshall & Huschart Mchry. Co., Chi-  
 cago, Ill.  
 Mossbrug, Frank Co., Attleboro, Mass.  
 National Machinery Co., Tiffin, Ohio.  
 New Doty Mfg. Co., Janesville, Wis.  
 New Haven Mfg. Co., New Haven, Conn.  
 New York Machinery Depot, 178 Broad-  
 way, New York.  
 Niles Tool Wks., 188 Liberty St., N. Y.  
 Nilson, A. H. Mch. Co., Bridgeport Ct.  
 Norwood Machine Co., Bridgeport, Ill.  
 Pennsylvania Machinery Co., Phila., Pa.  
 Phila. Machine Tool Co., Phila., Pa.  
 Pittsburgh Mfg. Co., Pittsburgh, Pa.  
 Poole, Robt. & Son Co., Baltimore, Md.  
 Potter & Johnston Co., Pawtucket, R. I.  
 Poultner & Co., Phila., Pa.  
 Pratt & Whitney Co., Hartford, Conn.  
 Prentiss Bros., Worcester, Mass.  
 Prentiss Tool & Supply Co., 115 Liberty  
 St., N. Y.  
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.  
 Seyfert's Sons L. F., Philadelphia, Pa.  
 Sigmoury Tool Co., Hartford, Conn.  
 Thomas & Lowe Machinery Co., Prov-  
 ence, R. I.  
 Toomey, Frank, Philadelphia, Pa.  
 Wadsworth Farrel Foundry & Mch. Co.,  
 Waterbury, Conn.  
 Wetherill Robert & Co., Chester, Pa.  
 Windsor Machine Co., Windsor, Vt.  
 York, S. M. Co., Cleveland, O.  
**Machinery, Wood Working**  
 Egan Co., Cincinnati, O.  
**Machinery Springs**  
 Scott, Chas. Spring Co., Phila., Pa.  
**Machinery Builders**  
 Chapman, J. B. & Co., Springfield, Mass.  
 U. S. Projectile Co., Brooklyn, N. Y.  
**Machine Screws—See Screws. Ma-**  
**chine**  
**Machine Screw Work**  
 Spencer Automatic Mch. Screw Co.,  
 Hartford, Conn.  
**Machinie Tools—See Machinery**  
**Machine Work**  
 Nuttall, R. D. Co., Allegheny, Pa.  
**Machine Wrenches**  
 Billings & Spencer Co., Hartford, Conn.  
**Machinists' Scales**  
 Starrett, L. S. Co., Athol, Mass.  
**Machinists' Tools and Supplies**  
 Billings & Spencer Co., Hartford, Conn.  
 King, J. M. Co., Waterford, N. Y.  
**Manganese Bronze**  
 Hungerford, U. T. Brass & Copper Co.,  
 121 Worth St., N. Y.  
**Manufacturing Properties**  
 Hillman, J. H. & Co., Pittsburgh, Pa.  
**Manufacturing Sites**  
 Chicago, Milwaukee & St. Paul R. R.,  
 Chicago, Ill.  
 Southern Railway Co., Washington,  
 D. C.  
**Measuring Machines**  
 Rogers, Jno. M. Box, Gauge & Drill  
 Wks., Gloucester City, N. J.  
**Meat Choppers**  
 Enterprise Mfg. Co. of Pa., Phila., Pa.  
 Peck, Stow & Wilcox Co., 27 Murray St.,  
 New York.  
 Streeter, N. H. & Co., Rochester, N. Y.  
 Woodruff, O. D., Pottstown, Pa.  
**Mechanical Stokers**  
 Ideal Fuel Feeder Co., 31 Burling Slip,  
 N. Y.  
**Metal Brokers**  
 American Metal Co., 32 Broadway, N. Y.  
**Metal Ceilings**  
 Penn Metal Ceiling & Rfg. Co., Phila., Pa.  
**Metal Factors**  
 Stroud, E. H. & Co., Chicago, Ill.  
**Metal Lathing**  
 Penn Metal Ceiling & Roofing Co., Phila., Pa.  
**Metals**  
 Hepplewhite Bros., 49 Cliff St., N. Y.  
 Hotelier, Theo. & Co., Buffalo, N. Y.  
 Hungerford, U. T. Brass & Copper Co.,  
 121 Worth St., N. Y.  
 Rutter, A. T., 256 Broadway, N. Y.  
 United Metals Selling Co., 11 Broadway,  
 N. Y.  
**Metal Polish**  
 Hoffman, Geo. W., Indianapolis, Ind.  
**Metal Spinning**  
 Goodwin Kintz Co., Winsted, Conn.  
**Milling Machines**  
 Adams Co., Dubuque, Iowa.
- Becker-Brainard Milling Machine Co.,  
 Hyde Park, Mass.  
 Brown & Sharpe Mfg. Co., Providence.  
 Carter & Hale Mch. Co., Winsted, Ct.  
 Cincinnati Milling Mach. Co., 11th, O.  
 Garvin Machine Co., Spring and Varick  
 Sts., N. Y.  
 Lucas & Gillem, Philadelphia, Pa.  
 Whitney Mfg. Co., Hartford, Ct.  
**Mill Supplies**  
 General Supply Co., 40 John St., N. Y.  
**Mincing Knives**  
 Bishop, Geo. H. & Co., Cincinnati, O.  
 Painter Hdw. Mfg. Co., Troy, N. Y.  
**Mining Machinery**  
 Allis, E. P. Co., Milwaukee, Wis.  
 Band Drill Co., 100 Broadway, N. Y.  
**Mining Screens**  
 Harrington & King Perforating Co.,  
 Chicago, Ill.  
 Howard & Morse, 45 Fulton St., N. Y.  
 Michigan Wire Cloth Co., Detroit, Mich.  
**Miter Boxes**  
 Thomson Bros. & Co., Lowell, Mass.  
**Molding Machines**  
 Adams, o., Dubuque, Iowa.  
 Maywood Fdry. & Mch. Co., Chicago.  
**Motor Fans**  
 Hungerford, U. T. Brass & Copper Co.,  
 121 Worth St., N. Y.  
**Motors, Air**  
 Stow Flexible Shaft Co., Phila., Pa.  
**Motors, Petroleum**  
 Daimler Mfg. Co., Long Island City, N. Y.  
**Motors, Electric**  
 Eddy Electric Mf., Co., Windsor, Conn.  
 General Electric Co., Schenectady, N. Y.  
 Sturtevant, B. F. Co., Boston, Mass.  
**Motors, Vapor Marine**  
 Truscott Boat Mfg. Co., St. Joseph Mich.  
**Nail Clippers**  
 Cook, H. C. & Son, Ansonia, Conn.  
**Nail Machinery**  
 Crescent Mfg. Co., Belleville, Ill.  
 Pittsburgh Mfg. Co., Pittsburgh, Pa.  
**Nail Pullers**  
 Atwater Mfg. Co., Southington, Conn.  
 Bridgeport Mfg. Co., Bridgeport, Conn.  
 Hagen & Reid, Troy, N. Y.  
 Scranton & Co., The New Haven, Conn.  
 Snow L. T. New Haven, Conn.  
**Name Plates, Machinery**  
 Livermore, Homer F., Boston, Mass.  
 Nurdock Parlor Grate Co., Boston, Mass.  
**Natural Gas Pump**  
 Norwalk Iron Wks. Co., So., Norwalk, Ct.  
**Nickel Platers' Supplies**  
 Eddy Electric Mfg. Co., Windsor, Conn.  
**Nickeloid**  
 American Nickeloid Co., Peru, Ill.  
**Norway Shapes**  
 Rowland, William & Harvey, Frank-  
 ford, Philadelphia.  
**Nuts—See Bolts**  
**Nuts, Self-Locking**  
 National Elastic Nut Co., Milwaukee,  
 Wis.  
**Nut Machines**  
 Dunham Nut Co., Unionville, Conn.  
**Oil Burning Appliances**  
 Rockwell, Engineering Co., 26 Cortlandt  
 St., N. Y.  
**Oil Heaters—See Oil Stoves**  
**Oil Stones**  
 Pike Mfg. Co., Pike Station, N. H.  
**Oil Stoves—(See Stoves Oil, Vapor and**  
**Gasoline)**  
**Oilers**  
 Gen. Mfg. Co., Pittsburgh, Pa.  
 Hammer & Co., Branford, Conn.  
 Wilmer & Hobbs Mfg. Co., Bridgeport,  
 Conn.  
**Oilless Bearings**  
 North American Metalline Co., Long  
 Island City, N. Y.  
**Ore Breakers**  
 Aultman Co., Canton, O.  
 Cresson, Geo. V. Co., Phila., Pa.  
**Ores**  
 Blair, Reed F. Co., Pittsburgh, Pa.  
 Samuel, Frank, Philadelphia, Pa.  
 Wister, Francis, Philadelphia, Pa.  
**Ox Shoes**  
 Scranton Forging Co., Scranton, Pa.  
 Woodruff, Walter W. & Sons, Mt. Carmel, Conn.  
**Packing**  
 May & Shelding Co., Boston, Mass.  
 Morrison, Robert, St. Louis, Mo.  
 Peerless Rubber Mfg. Co., 16 Warren  
 Street, N. Y.  
**Packing, Iron**  
 Smooth On Mfg. Co., Jersey City, N. J.  
**Paints**  
 Dixon, Jon, Crucible Co., Jersey City, N. J.  
**Pants Stretchers**  
 Covert Mfg. Co., West Troy, N. Y.  
**Patent Solicitors**  
 Goepel & Baegener, 290 Broadway,  
 N. Y.  
 Hamlin, Geo. R., Washington, D. C.  
 Howson & Howson, Philadelphia and  
 Washington.  
 Stocking, E. B., Washington, D. C.  
**Pattern Letters**  
 St. Louis Electrotype Foundry, St. Louis  
**Pattern Makers**  
 Seidenbaum, C., Cleveland, O.  
**Perforated Metal**  
 Clinton Wire Cloth Co., Clinton, Mass.  
 Harrington & King Perforating Co., Chi-  
 cago, Ill.  
 Hungerford, U. T. Brass & Copper Co.,  
 121 Worth St., N. Y.  
**Phosphor Bronze**  
 Hungerford, U. T. Brass & Copper Co.,  
 121 Worth St., N. Y.  
 Phosphor Bronze Smelting Co., Limited,  
 Philadelphia.  
**Phosphor Tin**  
 Crescent Phosphorized Metal Co., Phila.,  
 Pa.  
 Balk & Naumann, 518 Pearl St., N. Y.  
**Piano Plate Manufacturers**  
 Randolph Iron Co., Brooklyn, N. Y.  
**Picture Wire**  
 Oswawian Mills Co., Norwich, Conn.  
**Pig Casting Machines**  
 Heyl & Patterson, Pittsburgh, Pa.  
**Pig Iron**  
 Ashland Steel Co., Ashland, Ky.  
 Baird, C. H. & Co., Phila., Pa.  
 Danville Bessemer Co., Danville, Pa.  
 Dimmick, J. K. & Co., Phila., Pa.  
 Hickman, Williams & Co., Chicago, Ill.  
 Houston, C. B. & Co., Philadelphia, Pa.  
 Nicoll, B. & Co., 68 Wall St., N. Y.  
 Samuel, Frank, Philadelphia, Pa.  
 Snyder, W. P. & Co., Pittsburgh, Pa.  
 Superior Charcoal Iron Co., Grand Rap-  
 id, Mich.  
 Tennessee Coal, Iron & R. R. Co., Bir-  
 mingham, Ala.  
 Tidewater Steel Co., Phila., Pa.  
 Virginia Iron, Coal and Coke Co., Bris-  
 tol, Va.  
**Pig Iron Storage**  
 Am. Pig Iron Storage Warrant Co., 4  
 Wall St., N. Y.  
**Pig Lead**  
 Penna. Smelting Co., Pittsburgh, Pa.  
**Pile Drivers**  
 Vulcan Iron Works, Chicago, Ill.  
**Pipe, Bent**  
 Harrisburg Pipe Bending Co., Harris-  
 burg, Pa.  
 National Pipe Bending Co., New Haven,  
 Conn.  
 National Tube Co., Pittsburgh, Pa.  
 Whitlock & oil Pipe Co., Elmwood, Ct.  
**Pipe Coupling**  
 Williams, J. H. & Co., Brooklyn, N. Y.  
**Pipe Cutting and Threading Ma-**  
**chines**  
 Bignal & Keeler Mfg. Co., Edwards-  
 ville, Ill.  
 Jaricki & Curds, Bridgeport, Conn.  
 Jaricki Mfg. Co., Erie, Pa.  
 Merrill Mfg. Co., Toledo, O.  
 Saunders' Sons, D., Yonkers, N. Y.  
**Pipe Grips**  
 Prentiss Vice Co., 44 Barclay, N. Y.  
**Pipes, Fittings, &c.**  
 Jaricki Mfg. Co., Erie, Pa.  
 McNab & Harlin Mfg. Co., N. Y.  
**Pipe, Riveted Steel**  
 Pollock, W. B. Co., Youngstown, O.  
 Seale, Wm. B. & Sons, Pittsburgh.  
**Pipe Unions**  
 Dart, E. M. Mfg. Co., Providence, R. I.  
**Pipe, Water and Gas**  
 Lee-Odium Boiler Co., Memphis, Tenn.  
 Miller, C. & Son Co., Utica, N. Y.  
 National Tube Co., Pittsburgh, Pa.  
 Reading Dry, Co., Reading, Pa.  
 Red Jacket Mfg. Co., Davenport, Iowa,  
 U. S. Cast Iron Pipe & Foundry Co.,  
 Phila., Pa.  
 Warren City Boiler Works, Warren, O.  
 Wood, R. D. & Co., Philadelphia, Pa.  
**Planes**  
 Stanley Rule & Level Co., N. Y.  
**Planers**  
 Amer. Tool Works Co., Cincinnati, O.  
 Baird, U. Machinery Co., Pittsburgh, Pa.  
 Bennett, Miles & Co., Phila., Pa.  
 Detrich & Harvey Mch. Co., Baltimore.  
 Draper Mch. Tool Co., Worcester, Mass.  
 Whitcomb Mfg. Co., Worcester, Mass.  
 Wilson, W. A., Rochester, N. Y.  
**Plated Ware**  
 International Silver Co., Meriden, Ct.  
**Plates, Iron and Steel**  
 Danville Bessemer Co., Danville, Pa.  
 Jones & Laughlin, Ldt., Pittsburgh, Pa.  
 Lukens Iron & Steel Co., Coatesville, Pa.  
 Pine Iron Works Co., Pine Iron Works,  
 Pa.  
 Singer, Nimick & Co., Inc., Pittsburgh,  
 Pa.  
 Tidewater Steel Co., Phila., Pa.  
 Wood, Alan Co., Philadelphia.  
**Plate Iron Work**  
 Scalf, Wm. B. & Sons, Pittsburgh.  
**Pliers**  
 Bridgeport Mfg. Co., Bridgeport, Conn.  
 Utica Drop Forge & Tool Co., Utica,  
 N. Y.  
**Pneumatic Tools**  
 Chicago Pneumatic Tool Co., Chicago,  
 Ill.  
 Phila. Pneumatic Tool Co., Phila., Pa.  
 Q & Co., Chicago, Ill.  
**Pocket Knives**  
 Cuttarausus Cutlery Co., Little Valley,  
 N. Y.  
**Polishing Wheels**  
 Divine Bros. Co., Utica, N. Y.  
**Portable Track**  
 Atlas Bolt & Screw Co., Cleveland, O.  
**Poultry Fencing**  
 DeKalb Fence Co., DeKalb, Ill.  
**Poultry Nettings**  
 Gilbert & Bennett Mfg. Co., 42 Cliff St.,  
 N. Y.  
 N. J. Wire Cloth Co., Trenton, N. J.  
 Tyler, W. S. Co., Cleveland, O.  
 Wright & Colton Wire Cloth Co., Wor-  
 cester, Mass.  
**Poultry Netting and Setting Racks**  
 Burton, Matthew, Batavia, Ill.  
**Power Hack Saws**  
 Hoefer Mfg. Co., Freeport, Ill.  
**Powder Hammers**  
 Beaudry & Co., Boston, Mass.  
 Bradley Co., Syracuse, N. Y.  
 Dienelt & Eisenhardt, Philadelphia.  
 Dupont Mfg. Co., St. Johnsbury, Vt.  
 Kidder, R. E., Worcester, Mass.  
 Long & Alstatter Co., Hamilton, Ohio.  
 Miner & Peck Mfg. Co., New Haven, Ct.  
 Scranton & Co., The, New Haven, Conn.  
**Power Transmitting Mach'y**  
 Cresson, Geo. V. Co., Phila., Pa.  
 Dodge Mfg. Co., Mishawaka, Ind.  
 Machinist's Supply Co., Rochester, N. Y.  
 Norwalk Iron Wks. Co., So., Norwalk, Ct.  
**Pressed Metal Work**  
 Avery Stamping Co., Cleveland, Ohio.  
**Presses, Power**  
 Adriance Mach. Works, Brooklyn, N. Y.  
 Bliss, E. W. Co., Brooklyn, N. Y.  
 Cross & Speirs Mch. Co., Waterbury, Ct.  
 Ferrocute Mch. Co., Bridgeport, N. J.  
 Hubbard, W. H., Brooklyn, N. Y.  
 Hilles, Jones & Co., Wilmington, Del.  
 Leffler, Chas. & Co., Brooklyn, N. Y.  
 Manville, E. J. Mch. Co., Waterbury, Ct.  
 Merriman, A. H., Meriden, Conn.  
 Mossberg & Granville Mfg. Co., Provi-  
 dence, R. I.  
 Niagara Machine & Tool Wks., Buffalo.  
 Phila. Machine Tool Co., Phila., Pa.  
**Projects**  
 National Tube Co., Pittsburgh, Pa.  
**Propeller Wheels**  
 Truscott Boat Mfg. Co., St. Joseph, Mich.  
**Pruners**  
 Henry, John T. Mfg. Co., Hamden, Ct.  
**Pulleys**  
 Amer. Pulley Co., Phila., Pa.  
 Dodge Mfg. Co., Mishawaka, Ind.  
 Hartman Machinery Co., New Haven, Conn.  
 Evans, G. F., Boston, Mass.  
 Jones & Laughlin, Ldt., Pittsburgh, Pa.  
 Saginaw Mfg. Co., Saginaw, Mich.  
 Woods, T. B. Sons, Chambersburg, Pa.  
**Pumping Machinery**  
 Cook, A. D., Lawrenceburg, Ind.  
 Filer & Stowell Co., Milwaukee, Wis.  
 Ingersoll-Sergeant Drill Co., 26 Cort-  
 land St., N. Y.  
 McGowan, J. H. & Co., Cincinnati, O.  
 Southwick Fdry. & Mch. Co., Philadel-  
 phia, Pa.  
**Pumps**  
 Athol Pump Co., Athol, Mass.  
 Barnes Mfg. Co., Mansfield, O.  
 Deming Co., Salem, O.  
 Edison Mfg. Co., Boston, Mass.  
 Flint & Walling Co., Kendallville, Ind.  
 Humphries Mfg. Co., Mansfield, O.  
 Myers, F. E. & Bro., Ashland, Ohio.  
 Red Jacket Mfg. Co., Davenport, Ia.  
 Ruellin, H. B., Johnstown, O.  
 St. Joseph Pump & Mfg. Co., St. Joseph,  
 Mo.  
 Wilder, S. & Co., Holliston, Mass.  
**Punches, Conductors'**  
 Woodman, R. Mfg. & Supply Co., Bos-  
 ton, Mass.  
**Punches and Shears, Hand and**  
**Power**  
 Bethlehem Foundry & Machine Co., So.  
 Bethlehem, Pa.  
 Buckwell Hdw. Co., Javerville, Wis.  
 Bliss, E. W. Co., Brooklyn, N. Y.  
 Hilles & Jones Co., Wilmington, Del.  
 Long & Alstatter Co., Hamilton, Ohio.  
 Merschke, C. S. & Co., New Haven, Conn.  
 New Doty Mfg. Co., Janesville, Wis.  
 Williams, White & Co., Moline, Ill.  
**Punching and Shearing**  
 Harrington & King Perforating Co.,  
 Chicago, Ill.  
**Push Carts**  
 Syracuse Chilled Plow Co., Syracuse.  
**Pyrometers**  
 Brown, Edward, Phila., Pa.  
 Uehling, Steinbart & Co., Ltd., Carl-  
 stadt, N. J.  
**Railways, Industrial**  
 Hunt, C. W. Co., West New Brighton,  
 N. Y.  
**Rat and Mouse Traps**  
 Burditt & Williams, Boston, Mass.  
**Razors**  
 Buck Bros., Millbury, Mass.  
 Swedish Razor Co., Worcester, Mass.  
**Razor Hones**  
 Pike Mfg. Co., Pike Station, N. H.  
**Reading Stands**  
 Allen, D. H. & Co., Miamisburg, O.  
**Reamers**  
 Morse Twist Drill & Mch. Co., New Bed-  
 ford, Mass.  
**Recording Gauges**  
 Bristol Co., Waterbury, Conn.  
 Uehling, Steinbart & Co., Ltd., Carl-  
 stadt, N. J.  
**Reels**  
 Hendryx, A. B. Co., New Haven, Conn.  
**Refrigerating Machinery**  
 York Mfg. Co., York, Pa.  
**Refrigerators**  
 Maine Mfg. Co., Nashua, N. H.  
 Wilke Mfg. Co., Richmond, Ind.  
**Registers**  
 Stowell Mfg. & Foundry Co., So., Mil-  
 waukee, Wis.  
**Relaying Rails**  
 Donaldson & Newton, Phila., Pa.  
 Hyde Bros. & Co., Pittsburgh, Pa.  
 Isaac Joseph Iron Co., Cincinnati, O.  
 May & Spalding, 32 Broadway, N. Y.  
 Steel Rail Supply Co., 100 Broadway,  
 N. Y.  
**Reloading Tools**  
 Bridgeport Gun Implement Co., 313-315  
 Broadway, N. Y.  
 Hungerford, U. T., Brass & Copper Co.,  
 121 Worth St., N. Y.  
 Ideal Mfg. Co., New Haven, Conn.  
**Repairing Sets, Family**  
 Star Heal Plate Co., Newark, N. J.  
**Repair Outfits, Farmers'**  
 Imperial Bit & Snap Co., Racine, Wis.  
**Revolution Counters**  
 Pitkin, A. B. Machry. Co., Providence,  
 R. I.  
 Tabor Mfg. Co., Elizabeth, N. J.  
**Revolvers**  
 Harrington & Richardson Arms Co.,  
 Worcester, Mass.  
 Hopkins & Allen Arms Co., Norwich,  
 Ct.  
 Johnson, Iver, Arms & Cycle Works,  
 Fitchburg, Mass.  
**Rheostats**  
 Cutler-Hammer Mfg. Co., Milwaukee,  
 Wis.  
 Electric Controller & Supply Co., Cleve-  
 land, O.  
**Rifles**  
 Hopkins & Allen Arms Co., Norwicb,  
 Ct.

Marlin Fire Arms Co., New Haven, Ct.  
Remington Arms Co., 315 Broadway,  
N. Y.

Stevens Arms & Tool Co., Chicopee  
Falls, Mass.

**Riveters**  
Phila. Pneumatic Tool Co., Phila., Pa.

**Riveters, Harness**  
Orangeville Ag'l Works & Foundry,  
Orangeville, Pa.

**Riveters, Pneumatic**  
Chicago Pneumatic Tool Co., Chicago,  
Ill.

**Rivets**  
American Iron & Steel Mfg. Co., Le-  
banon, Pa.

American Screw Co., Providence, R. I.  
Blake & Johnson, Waterbury, Conn.

Barden Iron Co., Troy, N. Y.

Clark & Cowles, Plainville, Conn.

Cobb & Drew, Plymouth, Mass.

Grand Crossing Tack Co., Grand Cross-  
ing, Ills.

Hungerford, U. T., Brass & Copper Co.,  
121 Worth St., N. Y.

Plymouth Mills, Plymouth, Mass.

Rockford Bolt Works, Rockford, Ill.

Townsend C. C. & E. P., New Brighton  
Pa.

**Riveting Machines**  
Bethlehem Foundry & Mch. Co., So-

sherton, F. E. Co., New Haven, Conn.

**Rackers and Bakers**  
Shepard, Sidney & Co., Buffalo, N. Y.

**Rod Mill Machinery**  
Braddock Machine & Mfg. Co., Brad-  
dock, Pa.

Morgan Construction Co., Worcester  
Mass.

**Roll Turning Tools**  
Trethewey, Sam'l & Co., Ltd., Pittsburgh

**Roller Bearings**  
Ball Bearing Co., Boston, Mass.

Mossberg & Granville Mfg. Co., Prov-  
idence, R. I.

**Rollers**  
Wheathurst, R. W. & Co., Norfolk, Va.

**Rolling Mill Machinery**  
Booth, The Loyd Co., Youngstown, O.

Farrell Dry & Mch. Co., Ansonia, Ct.

Frank-Kneeland Mach. Co., Pittsburgh.

Garrison, A. Dryg. Co., Pittsburgh.

Mesta Machine Co., Pittsburgh, Pa.

Morgan Construction Co., Worcester,  
Mass.

Mossberg & Granville Mfg. Co., Prov-  
idence, R. I.

Totten & Hogg Iron & Steel Fdry. Co.,  
Pittsburgh, Pa.

**Rolls, Chilled, Sand and Steel**  
Booth, The Loyd Co., Youngstown, O.

Frank-Kneeland Mach. Co., Ansonia, Ct.

Garrison, A. Dryg. Co., Pittsburgh.

Lorain Foundry Co., Lorain, Ohio.

Mesta Machine Co., Pittsburgh, Pa.

Seaman, Sleeth Co., Pittsburgh.

Totten & Hogg Iron and Steel Fdry. Co.,  
Pittsburgh, Pa.

Youngstown Foundry & Machine Co.,  
Youngstown, O.

**Roofing and Siding**  
Cincinnati Corrugating Co., Plqua, O.

Garry Iron & Steel Roofing Co., Cleve-  
land, O.

Kanneberg Roofing Co., Canton, O.

Penn Metal Ceiling & Roofing Co., Phila.,  
Pa.

Scaife, Wm. B. & Sons, Pittsburgh

Youngstown Iron & Steel Roofing Co.,  
Youngstown, O.

**Rope and Cordage.**  
American Mfg. Co., 65 Wall St., N. Y.

Waterbury Rope Co., 69 South St., N. Y.

**Rope and Web Goods**  
Covert Mfg. Co., West Troy, N. Y.

**Rope Shield**  
Ironsides Co., Columbus, Ohio.

**Rope Transmission and Hoisting**  
American Mfg. Co., 65 Wall St., N. Y.

California Wire Works, San Francisco,  
Cal.

Hunt, C. W. Co., West New Brighton,  
N. Y.

Linden, A. & Sons, Rope Co., St. Louis,  
Mo.

Wood, T. B. Sons, Chambersburg, Pa.

**Rubber Goods**  
Boston Belting Co., Boston, Mass.

Canfield, H. O., Bridgeport, Conn.

Peerless Rubber Mfg. Co., 16 Warren  
Street, N. Y.

**Rules**  
Lufkin Rule Co., Saginaw, Mich.

Stanley Rule & Level Co., 29 Chambers  
St., N. Y.

**Sash Irons**  
Williams, A. C., Ravenna, O.

**Sash Iron Handles**  
Schrayers, M. Sons & Co., Chicago, Ill.

**Sash Glass Apparatus**  
Edgar T. & Sons, Boston, Mass.

**Sash Paper**  
Baeder, Adamson & Co., Phila., Pa.

**Sapphires**  
Mender Cutting Factories, 51-53 Maiden  
Lane, N. Y.

**Sash Balances**  
Caldwell Mfg. Co., Rochester, N. Y.

Fullman Sash Balance Co., Rochester,  
N. Y.

Streetter, N. R. & Co., Rochester, N. Y.

**Sash Cords and Chains**  
Bridgeport Chain Co., Bridgeport, Conn.

Morton, Thos., 65 Elizabeth, N. Y.

Samson Cordage Works, Boston, Mass.

Silver Lake Co., Boston, Mass.

Smith & Egge Mfg. Co., Bridgeport.

**Sash Locks**  
Fitch, W. & E. T. Co., The, New Haven,  
Conn.

Ives, H. B. & Co., New Haven, Conn.

Oefinger, J. L., Chicago, Ill.

**Sash Pulleys**  
For Machine Co., Grand Rapids, Mich.

Grand Rapids Hardware Co., Grand  
Rapids, Mich.

Palmer Hardware Mfg. Co., Troy, N. Y.

**Sash Weights**  
Barney Keed Mfg. Co., Boston, Mass.

Brown, E. E. & Co., Philadelphia, Pa.

**Sausage Stuffers**  
National Specialty Mfg. Co., Phila., Pa.

**Saws**  
Atkins, E. C. & Co., Indianapolis, Ind.

Bishop, Geo. H. & Co., Cincinnati, Ohio.

Blanton, Henry & Sons, Inc., Phila., Pa.

Jennings, C. E. & Co., 101 Beale Street,  
N. Y.

National Saw Co., Newark, N. J.

Simonds Mfg. Co., Fitchburg, Mass.

**Saw Guides**  
Thomson Bros. & Co., Lowell, Mass.

**Saw Handles**  
Ladd, W. C., Bristol, Conn.

**Saw Sets**  
Dissot, Henry & Sons, Inc., Phila., Pa.

Taintor Mfg. Co., 9 to 15 Murray, N. Y.

**Saw Tools**  
Atkins, E. C. & Co., Indianapolis, Ind.

**Scales**  
American Cutlery Co., Chicago, Ill.

Chatillon, John & Sons, 85-89 Cliff, N. Y.

Chiago Scale Co., Chicago, Ill.

Plouze Scale & Mfg. Co., Chicago, Ill.

Reading Hardware Co., Reading, Pa.

Standard Scale & Supply Co., Pittsburgh.

**Scrap Metals**  
Blake, J. M. & Co., 10th Ave. and 15th  
St., N. Y.

Boettjer, Co., Hoboken, N. J.

Green, F., Philadelphia, Pa.

Hanner, H. A. & Sons, Phila., Pa.

Hoffeller, Theo. & Co., Buffalo, N. Y.

Leonard, John & Co., 22 Broadway, N. Y.

N. J. Iron & Metal Co., Paterson, N. J.

Perry, Wm. H. Co., Providence, R. I.

Phillips, F. R. Sons, Ph. la., Pa.

Rogers, W. H., Bridgeport, Conn.

Samuels, M. Sons, Brooklyn, N. Y.

Smyth, Morton B. Co., New York.

**Scrapers, Road**  
American Steel Scraper Co., Sidney, O.

Aultman Co., Canton, Ohio.

Albion & Jacobs Mfg. Co., Colum-  
bus, Ohio.

Sidney Steel Scraper Co., Sidney, O.

Syracuse Chilled Flow Co., Syracuse,  
N. Y.

**Screens, Perforated Metal**  
Harrington & King Perforating Co.,  
Chicago, Ill.

**Screens, Window and Door**  
Daroy, Edw., Sons, Philadelphia, Pa.

**Screw Cutting Dies**  
Card, S. W. Mfg. Co., Mansfield, Mass.

Geometric Drill Co., Westville, Conn.

Rogers, Jno. M. Boat Gauge & Drill  
Wks., Gloucester City, N. J.

Wells Bros. & Co., Greenfield, Mass.

Wiley & Russell Mfg. Co., Greenfield,  
Mass.

**Screws Drivers**  
Brown, R. H. & Co., New Haven, Conn.

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

Distant, Henry & Sons, Inc., Phila., Pa.

Goodell-Pratt Co., Greenfield, Mass.

North Bros., Wm. H. Co., Philadelphia, Pa.

Patent Co., Fitchburg, Mass.

**Screws, Machine**  
American Tool Wks Co., Cincinnati, O.

Brown & Sharpe Mfg. Co., Providence,

Costello, J. E. Mch. Wks., Brooklyn, N. Y.

Draper Mach. Tool Co., Worcester, Mass.

Garvin Mach. Co., Springfield, Vt.

Jones & Lamson Mch. Co., Springfield, Vt.

Windsor Mch. Co., Windsor, Vt.

**Screws**  
Coach

Hall's Sam'l Sons, 229 West 10th St., N. Y.

Haskell, Wm. H. Mfg. Co., Pawtucket,  
R. I.

**Machines**  
American Screw Co., Providence, R. I.

Chicopee Screw Co., Chicago, Ill.

Haskell, Wm. H. Mfg. Co., Pawtucket

Hubbell, Harvey, Bridgeport, Conn.

Miles, P. S., 265 Quarry, Philadelphia,  
New Britain Hdw. Mfg. Co., New Brit-  
ain, Conn.

Philha. Mach. Screw Works, Phila., Pa.

Pittsburgh Screw & Bolt Co., Pittsburgh,  
Pa.

Rhode Island Tool Co., Providence, R. I.

Worcester Mch. Screw Co., Worcester.

**Wood**

American Screw Co., Providence, R. I.

Franklin Mch. Co., Winsted, Conn.

**Screw Saws**  
Barnes, W. F. & John Co., Rockford, Ill.

Milwaukee Falls Co., 28 Warren St., N. Y.

Seneca Falls Mfg. Co., Seneca Falls,  
N. Y.

**Seythe Stones and Whetstones**  
Cleveland Stone Co., Cleveland, O.

Pike Mfg. Co., Pike Station, N. H.

**Seamless Steel Tubes**  
Janney, Steimmetz & Co., Phila., Pa.

National Tube Co., Pittsburgh, Pa.

**Sewing Machines**  
National Sewing Machine Co., Bel-  
videre, Ill.

**Shafing**  
American Steel & Wire Co., Chicago, Ill.

Cresson, Geo. V. Co., Philadelphia, Pa.

Dodge Mfg. Co., Mishawaka, Ind.

Fairmount Mch. Co., Philadelphia, Pa.

Finished Steel Co., Youngstown, O.

Jones & Laughlin Co., Pittsburgh, Pa.

Pittsburgh Steel Shafting Co., Rankin,  
Pa.

Republic Iron & Steel Co., Chicago, Ill.

Roberts, A. & P. & Co., Phila., Pa.

**Shapers**  
Barker-Chard Mach. Tool Co., Cin-  
cinnati, O.

Gould & Eberhardt, Newark, N. J.

Potter & Johnston Co., Pawtucket, R. I.

Pittsburgh Shear, Knife & Machine Co.,  
Pittsburgh, Pa.

**Spring Hinges**  
Bonham Bros., Brooklyn, N. Y.

Coleman Hdwy. Co., Chicago, Ill.

Van Wagner & Williams Hdwy. Co.,  
Cleveland, O.

**Stacks**  
Scaife, Wm. B. & Sons, Pittsburgh.

**Stamped Ware**  
Jenkinson, R. C. & Co., Newark, N. J.

Keen & Hagerly, Mfg. Co., Baltimore.

New York Stamping Co., Brooklyn, N. Y.

**Stamping, Sheet Metal**  
American Hdwy. Mfg. Co., Ottawa, Illa.

American Railroad Way Supply Co., 24 Park  
Place, N. Y.

**Shears and Scissors**  
Acme Shear Co., Bridgeport, Conn.

Cattaraugus Cutlery Co., Little Valley,  
N. Y.

**Shear Knives**  
Pittsburgh Shear, Knife & Machine Co.,  
Pittsburgh, Pa.

**Trethewey, Sam'l & Co., Ltd., Pittsburgh**

**Stocks and Dies**  
American Cutlery Co., Newark, N. J.

Wells Bros. & Co., Greenfield, Mass.

Wells Bros. & Co., Greenfield, Mass.

**Stock Watergate**  
Reimers, J. N. & Co., Davenport, Iowa.

**Stokers, Mechanical**  
Ideal Fuel Feeder Co., 31 Burling Slip,  
N. Y.

National Cutlery Co., Phila., Pa.  
Webbush & Hillger, Ltd., 9-15 Murray  
St., N. Y.

**Shears, Metal**  
Carlins, Thomas Sons Co., Allegheny,  
Pa.

**Sheet Bars**  
National Steel Co., Battery Park Build-  
ing, N. Y.

**Sheet and Double Pointed Tacks**  
Grand Crossing Tack Co., Grand Cross-  
ing, Ill.

Milwaukee Tack Co., Milwaukee, Wis.  
Titchener, E. H. & Co., Binghamton,  
N. Y.

**Sheet Hammers, &c.**  
Diebold & Eisenhardt, Philadelphia.

Dudgeon, Richard, 24 Columbia St., N. Y.

Seilers, Wm. & Co., Inc., Phila., Pa.

**Steam Heating**  
Webster, Warren & Co., Camden, N. J.

**Steam Separators**  
Harrison Safety Boiler Wks., Phila., Pa.

**Steam Specialties**  
Crosby Steam Gage & Valve Co., Boston.

Mason Regulator Co., Boston Mass.

**Steel Balls**  
Cleveland Ball & Screw Co., Cleveland,  
Ohio.

**Steel Buildings**  
Berlin Iron Bridge Co., East Berlin, Ct.

Boston Bridge Works, Boston, Mass.

Kitter-Conley Mfg. Co., Pittsburgh, Pa.

Scalfe, Wm. B. & Sons, Pittsburgh, Pa.

**Steel Cold Rolled Strip**  
American Bicycle Mfg. Co., So. Chicago,  
Ill.

Wilmet & Hobbs Mfg. Co., Bridgeport.

Wolf, R. H. & Co., Ltd., 118th Street  
and Harlem River, N. Y.

**Steel Flanges, Weldless**  
Latrobe Steel Co., Philadelphia, Pa.

**Stone Cutting Machinery**

Gilmour, J., Bennett Bldg., N. Y.

**Stone Working Machinery**

Patch, F. R. Mfg. Co., Rutland, Vt.

**Store Fixtures**

Warren, J. M. Mfg. Co., Chicago, Ill.

**Stove Linings**

Ostrander Fire Brick Co., Troy, N. Y.

**Stove Pipe Thimbles**

Cheney, S. &amp; Son, Manlius N. Y.

**Stoves, Oil, Vapor and Gasoline**Novelties Mfg. Co., Jackson, Mich.  
Schneider & Trenkamp Co., Cleveland  
Ohio.**Structural Iron Work**Belmont Iron Works, Pella, Ia.  
Berlin Iron Bridge Co., E. Berlin, Conn.

Berlin Bridge Works, Boston, Mass.

Forest City Steel & Iron Co., Cleveland,  
Ohio.**Illinois Steel Co., Chicago, Ill.**Moseley Iron Bridge & Roof Co., 29  
Cortlandt St., N. Y.

Ritter-Conley Mfg. Co., Pittsburgh, Pa.

Shifner Bridge Co., Pittsburgh, Pa.

Stewart Iron Works, Cincinnati, Ohio.

West Side Foundry Co., Troy, N. Y.

**Structural Tubing**

Stalter-Bischoff Co., Chicago, Ill.

**Sulphuric Acid**Mattellessen & Hegeler Zinc Co., La  
Salle, Ill.**Swaging Machines**

Excelster Needs Co., Torrington, Ct.

**Table Ware**

International Silver Co., Meriden, Ct.

**Tack Claws**Mayhew, H. H. Co., Shelburne Falls,  
Mass.**Tacks, Brads, &c.**Diamond Tack & Nail Works, Raynham,  
Mass.Grand Crossing Tack Co., Grand Cross-  
ing, Ill.

Milwaukee Tack Co., Milwaukee, Wis.

Plymouth Mills, Plymouth, Mass.

Kipley &amp; Bartlett, Plymouth, Mass.

Shelton Co., Birmingham, Conn.

**Tack and Nail Machinery**

Kimball Bros. &amp; Sprague, Brockton,

Perkins, Henry, Bridgewater, Mass.

Sweetzer, W. A., Brockton, Mass.

**Tanks, Iron and Steel**

Lee-Lidium Boiler Co., Memphis, Tenn.

Scaife, Wm. B. &amp; Sons, Pittsburgh.

**Tapes**

Lurkin Rule Co., Saginaw, Mich.

**Tap Holder**

ideal Machine Works, Hartford, Conn.

**Tapping Machines**

Hin-Hell, Harvey, Bridgeport, Conn.

**Taps and Dies**

Beale, C. H. &amp; Co., Chicago, Ill.

Butterfield &amp; Co., Derby Line, Vt.

Card, S. W. Mfg. Co., Mansfield, Mass.

Reece, E. F. Co., Greenfield, Mass.

Wells Bros. &amp; Co., Greenfield, Mass.

Wiley &amp; Russell Mfg. Co., Greenfield.

**Telephones**

Manus Electric Co., Manus, Conn.

Rawson Electric Co., Elyria, Ohio.

**Terne Plate**

American Tin Plate Co., N. Y.

**Time Recorders**

Chicago Time Register Co., Chicago, Ill.

Heywood Bros. & Wakefield, Gardner,  
Mass.

Nanz, C. &amp; Co., 127 Duane St., N. Y.

**Tin Mills**

Philadelphia Roll &amp; Mch. Co., Phila., Pa.

Phillips, F. R. Sons, Philadelphia, Pa.

**Tinners' Tools and Machines**

Niagara Machine &amp; Tool Works, Buffalo.

**Tin Plate**

American Tin Plate Co., N. Y.

Merchant &amp; Co., Inc., Philadelphia, Pa.

**Tin Plate Machinery**

Lloyd Booth Co., Youngstown, Ohio.

**Tinware**

Keen &amp; Hagerty, Baltimore, Md.

**Tire Fluid**

Buffalo Specialty Mfg. Co., Buffalo, N. Y.

**Too Calks, Steel**

Burke, F. F., Boston, Mass.

**Toe Clips**

Snow, L. T., New Haven, Conn.

**Tool Chests**Am. Tool Chest Co., 200 W. Houston St.,  
New York.

Bliss, R. Mfg. Co., Pawtucket, R. I.

Jennings, C. E. Co., 101 Reade St., N. Y.

**Tool Grinders**

Seiters, Wm. &amp; Co., Inc., Phila., Pa.

Union Mfg. Co., Buffalo, N. Y.

**Tools**

Athol Machine Co., Athol, Mass.

Brunsdorf-Mueler Co., Elizabeth, N. J.

Brown, R. H. &amp; Co., New Haven, Conn.

Goodell Pratt Co., Greenfield, Mass.

Mayhew, H. H. Co., Shelburne Falls,

Millers Falls Co., 28 Warren St., N. Y.

Springfield Machine Screw Co., Spring-

field, Mass.

Stanley Rule &amp; Level Co., 29 Chamber-

St., New York.

Starrett, L. S. Co., Athol, Mass.

Stevens, J., Arms &amp; Tool Co., Chicopee.

**Tools, Blacksmith and Wheel-  
wright**

Champion Blower &amp; Forge Co., Lan-

caster, Pa.

Wiley &amp; Russell Mfg. Co., Greenfield,

Mass.

**Tools, Steam and Gas Fitters'**

Saunders' Sons, D., Yonkers, N. Y.

**Torches, Oil and Gasoline**

Schneider &amp; Trenkamp Co., Cleveland,O.

**Tote Boxes**

Clark, W. J. &amp; Co., Salem, O.

**Toys, Iron**

Coleman Hardware Co., Chicago, Ill.

**Transom Openers**

Ormsby, E. A., Melrose, Mass.

**Traps, Animal**

Hawkins, Co., Waterbury, Conn.

**Tree Guard**

Hartman Mfg. Co., 209 Broadway, N. Y.

Up-to-date Mfg. Co., Terre Haute, Ind.

**Trolleys**

Box, Alfred &amp; Co., Philadelphia, Pa.

**Trowels**

Bishop, Geo. H. &amp; Co., Cincinnati, O.

National Saw Co., Newark, N. J.

**Trucks**

Boston &amp; Lockport Block Co., Lockport,

Kilbourne &amp; Jacobs Mfg. Co., Columbus,

Lansing Wheelbarrow Co., Lansing,

Mich.

Syracuse Chilled Plow Co., Syracuse,

N. Y.

**Tub Hoops**

Oatman Bros., Medina, Ohio.

**Tubes, Seamless Drawn Copper,  
Brass and Bronze**

Ansonia Brass &amp; Copper Co., 90 John

St., N. Y.

Hungerford, U. T., Brass &amp; Copper Co.,

121 Worth St., N. Y.

Randolph-Clowes Co., Waterbury, Conn.

**Tubing, Brass**

Hungerford, U. T., Brass &amp; Copper Co.,

121 Worth St., N. Y.

Phoenix Tube Co., Brooklyn, N. Y.

Spofford, W. S. &amp; Son, Providence, R. I.

**Tubing, Iron**

Phoenix Tube Co., Brooklyn, N. Y.

**Tubing, Steel**

Heat Transmission Co., Danbury, Ct.

Heckert-Baltzley Billet Co., Toledo, O.

Janney, Steinmetz &amp; Co., Phila., Pa.

Leng's John S. Son &amp; Co., 4 Fletcher St.

National Tube Co., Pittsburgh, Pa.

Shelby Steel Tube Co., Cleveland, O.

Stalter-Bischoff Co., Chicago, Ill.

**Tumbling Barrels**

Henderson Bros., Waterbury, Conn.

Northern Engineering Works, Detroit,

Mich.

**Turnbuckles**

Cleveland City Forge &amp; Iron Co., Cleve-

land, O.

**Twist Drills**

Cleveland Twist Drill Co., Cleveland,

Graham, John H. &amp; Co., 118 Chambers

St., N. Y.

Morse Twist Drill &amp; Machine Co., New

Bedford, Mass.

New Process Twist Drill Co., Taunton,

Mass.

Slocumb, J. T. &amp; Co., Providence

R. I.

Standard Tool Co., Cleveland, O.

**Twist Drill Grinders**

Fuller Mfg. Co., Kalamazoo, Mich.

Fauld, L. S. &amp; Son, Barre, Mass.

Washburn Shops of Worcester Poly-

technic Inst., Worcester, Mass.

**Upholsterers' Hardware**

Hungerford, U. T., Brass &amp; Copper Co.,

121 Worth St., N. Y.

**Valves, Gas, Water and Steam**

Ashton Valve Co., Boston, Mass.

Chapman Valve Mfg. Co., Boston,

Cross &amp; Steam Gage &amp; Valve Co., Boston,

Jenkins Bros., 77 John, N. Y.

McNamey Valve Mfg. Co., 75 John St.,

N. Y.

McNab &amp; Harlin Mfg. Co., 56 John, N. Y.

Mason Regulator Co., Boston, Mass.

Reading Fdry. Co., Reading, Pa.

Wood, R. D. &amp; Co., Philadelphia, Pa.

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Howard &amp; Morse, 45 Fulton, St., N. Y.

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Ludlow Saylor Co., St. Louis, Mo.

Michigan Wire Cloth Co., Detroit, Mich.

N. J. Wire Cloth Co., Trenton, N. J.

New York Wire Cloth Co., 102 Chambers

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Wickwire Bros., Cortland, N. Y.

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**Wire Cutters**

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Lewis Tool Co., 44 Barclay St., N. Y.

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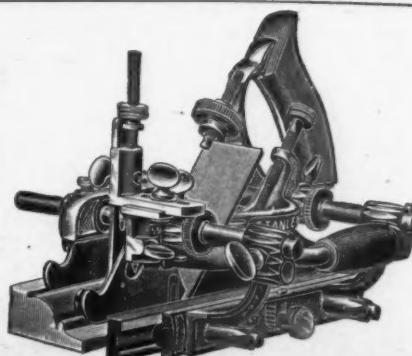
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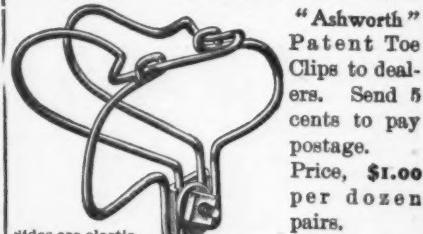
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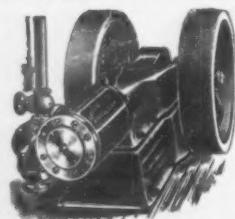
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